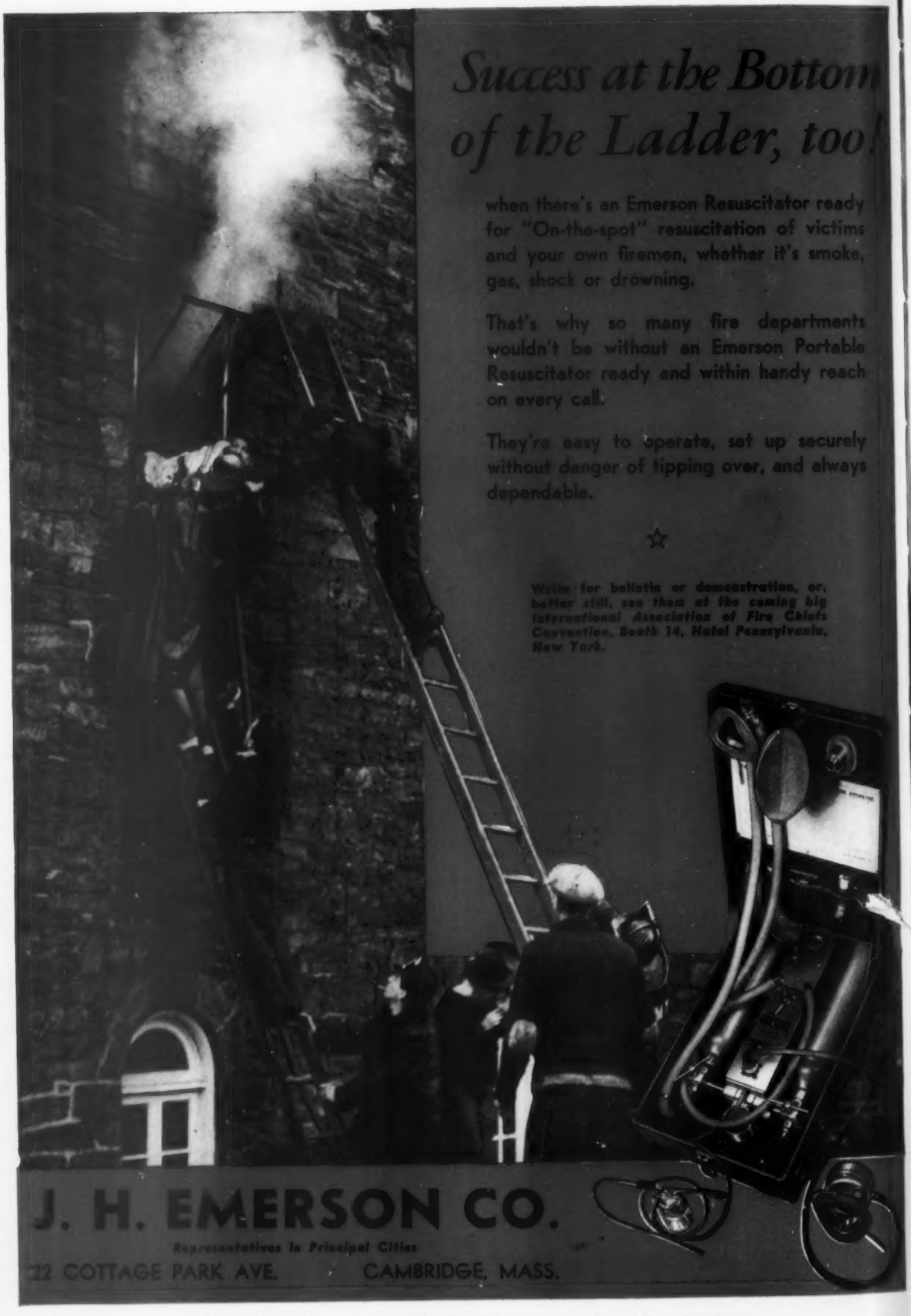
FIRE ENGINEERING

The Journal of the Fire Protection Profession Since 1877

AUGUST, 1947

A CASE - SHEPPERD - MANN PUBLICATION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when there's an Emerson Resuscitator ready for "On-the-spot" resuscitation of victims and your own firemen, whether it's smoke, gas, shock or drowning.
That's why so many fire departments wouldn't be without an Emerson Portable Resuscitator ready and within handy reach on every call.
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and PROTECT YOUR INVESTMENT in
NEW EQUIPMENT

Modern fire-fighting equipment now being delivered will step up department efficiency—but to give that equipment and its personnel maximum protection through present day crowded traffic

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Match the efficiency of new equipment with effective signals engineered for long trouble-free service. For maximum protection specify a Federal Siren with Propello-Ray Light—the most striking visual signal yet developed.

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FIRE ENGINEERING

A Consolidation of FIRE AND WATER ENGINEERING, THE FIRE ENGINEER, FIRE PROTECTION *and* FIRE SERVICE

CONTENTS

VOL. 100 August, 1947 No. 8

	Page
With the Editor — By Fred Shepperd	527
Historic New York Fires Have Influenced the Fire Service — By Roi B. Woolley	529
Texas City: A Lesson in Oil Tank Fire Fighting — By Henry B. Peterson	542
How New York Keeps Its Fire Apparatus Rolling	545
Pictorial History of Artificial Respiration	548
The Use of Wetting Agents in Forest Fire Suppression — By Clarence E. Edson and William W. Parker	550
Department Operations Speeded by Two-Way F.M. Radiotelephone — By Fred E. Ebel	555
Lansing Department Reports on Use of High Pressure Fog — By H. H. Fisher	559
Juvenile Fire Setter Caught by Waterloo Fire Department — By Ray Tiller	560
News of the Manufacturers	565
Short Cuts and Gadgets	567
The Watch Desk — By Roi B. Woolley	568
Portrait Section	569
The Round Table — Juveniles—And Arson	575
False Alarms	576
World Wide Fire News — By Roi B. Woolley	594
Questions and Answers	598
Persons in the News	602
Correspondence	611
What's Burning	619
Convention Dates	621

FRED SHEPPERD
Editor

ROI B. WOOLLEY
Assistant Editor

70 Years Young

HOLDING the 74th Annual Convention of the International Association of Fire Chiefs in New York City this month reminds us how far the fire service has progressed since the last gathering of fire chiefs in this city, 'way back in 1913.

That progress is best shown by a comparison of this journal for the years 1913 and 1947*. In 1913, the "automobile fire engine" was still a doubtful entity in the minds of some hard-bitten fire fighters. Then, patent harness hitches were still being advertised, along with "chemical engines" and one enterprising advertiser was telling our readers that "horse-drawn apparatus need not be discarded," but could be "converted into his front-drive coupled unit." That was the period of the introduction of front-drive tractors, dual-rubber tires, and of the first advertising of "respirating devices."

In the apparatus field, names like Watrous, Peter Pirsch, Ahrens-Fox, Seagrave and American LaFrance, and in the equipment group, Gamewell Company, Eureka Fire Hose, Samuel Eastman, American District Telegraph and others were prominent in the 41st annual convention of the association—and in the convention numbers of this journal.

And speaking of those early advertisers, it's a happy coincidence that one of the largest users of space in 1913 "convention issues"—the B. F. Goodrich Company, is being welcomed back to FIRE ENGINEERING in this number, thirty-four years later.

Yes, there have been changes in the fire service—changes in methods, techniques and equipment. It's good to know, however, that these concerns, and other outstanding companies that have since entered the fire service field, are making steady progress with the service—and with FIRE ENGINEERING. To these 'old-timers' and the 'newcomers' we extend felicitations, and best wishes!

*Actually, this issue marks FIRE ENGINEERING's 70th Anniversary as the "Journal of the fire service."

The Publishers

FIRE ENGINEERING

The Journal of the Fire Profession since 1877; published on the fifteenth of each month by Case-Shepperd-Mann Publishing Corp., 24 West 40th St., New York 18, N. Y., also publishers of *Water Works Engineering, Sewage Works Engineering*, etc. ¶Subscription price: U. S., Latin America and Canada, $3.00 a year; Foreign, $4.00; Single copies, 35c. ¶Member of Audit Bureau of Circulations and Associated Business Papers, Inc. ¶Entered as second-class matter April 15, 1929, at the Post Office at New York, N. Y., under Act of March 3, 1879. ¶Contents of this issue copyrighted, 1947, by Case-Shepperd-Mann Publishing Corp. President and Advertising Director, KARL M. MANN; Vice-President and General Manager, I. HERBERT CASE; Secretary and Editorial Director, FRED SHEPPERD; Assistant Advertising Director, WALTER H. FREDRICKS; Eastern Representative, ALFRED J. HOUGHTON; Advertising Manager, WILLIAM J. GIBSON; Circulation Manager, W. H. TOPHAM. CHICAGO OFFICE: W. S. CLEVENGER and L. M. ROCHE, 8 So. Dearborn St., Chicago 3, Ill.; SAN FRANCISCO: CHARLES H. WOOLLEY, 605 Market Street, San Francisco 5, Calif.; Los ANGELES: AUGUST HAURIN, 6000 Miramonte Blvd., Los Angeles 1, Calif. ¶Printed in U. S. A.

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Enlarged and improved facilities at the Ward LaFrance plants in Elmira, N. Y., now make possible more and better Ward LaFrance Pumpers. Six completely new buildings are equipped with the latest machinery for manufacturing fire apparatus. As fast as suppliers are able to furnish materials, deliveries of Ward LaFrance Pumpers will be increased.

Ward LaFrance Pumpers are soundly equipped for the job of fire fighting because they are designed and engineered to surpass local requirements and to prove performance claims by road tests. For dependable fire protection, your community needs Ward LaFrance Pumpers. Remember, it pays to "Consider Ward LaFrance First."

Good luck to the 1947 IAFC Convention.

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First

High Torque.

Maximum horsepower developed at usable engine speed.

No "paper horsepower" that must be developed at passenger car engine speeds.

Simplicity of engine design with rugged, heavy-duty parts and without a multiplicity of small parts.

Compare the Torque, Horsepower and Speeds of Ward LaFrance Heavy-Duty, Fire Truck Engines.

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Pentrate is a new exclusive Alfco formula, scientifically compounded of chemical ingredients, 1% of which when added to ordinary water gives the combined solution speedy penetrating and spreading qualities much superior to water itself, and therefore more effective in fire fighting.

Just add 1 gallon of Pentrate to each 100 gallons of water in the booster tank and stir gently. The mixture immediately becomes wetter water. When applied on a stubborn, deep seated, smouldering fire, the speed with which it spreads and penetrates will surprise you. It gets to the heart of the fire in a hurry!

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Alfco Pentrate *penetrates* to the heart of the fire! Always keep enough on hand to meet emergencies. Pentrate can be used with present booster tank equipment. Available in five gallon cans.

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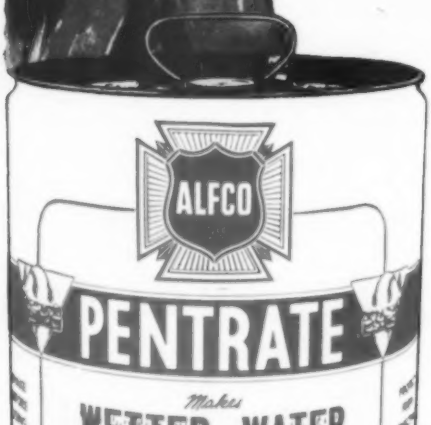

PENTRATE

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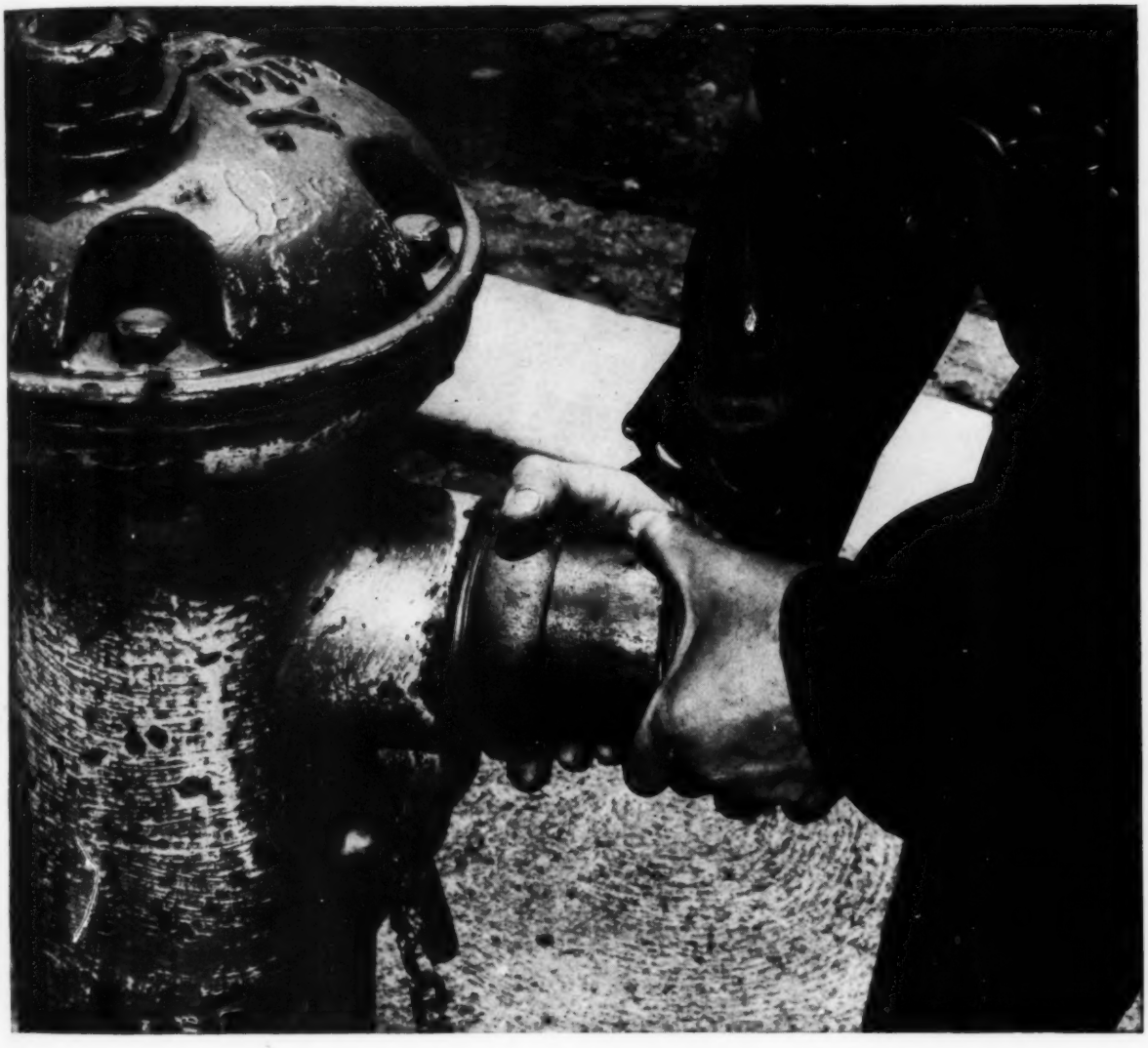

Koroseal gaskets cut coupling time in half

B. F. Goodrich fire hose is better than prewar hose

REGULAR rubber gaskets are resilient and easy to seal—at first. But they start hardening the minute they go into service. And many of them buckle easily. Soon, a spanner is required to make a tight seal. Then later, nothing will make a tight seal—and leaks begin.

That's not so with the *Koroseal* gaskets on B. F. Goodrich fire hose. They stay resilient indefinitely—never harden and cause leaks—never buckle—resist air, water and aging—and, because they stay resilient, can be coupled by hand pressure only, *cutting in half* the time required to make a coupling with a spanner.

But this is only one of the ways in which B. F. Goodrich fire hose is better than ever before. New methods of twisting the cord, a new way to weave the jacket, a new, age-resisting compound for the rubber tube—all add up to a substantial increase in strength—yet *a total weight reduction of 18%*. It's a lighter, stronger hose that gets into action faster than anything you've ever handled. And it lasts longer than former hose. New mildew protection preserves the jacket. Patented, exclusive new end protection prevents failures near couplings.

For a fire hose that gets into action faster, is easier to handle, reduces trouble and expense—specify B. F. Goodrich fire hose—better than prewar hose. *The B. F. Goodrich Company, Industrial Products Division, Akron Ohio.*

Koroseal—Trade Mark, Reg. U. S. Pat. Off.

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is equipped with nearly

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Specify ATLAS on all pumpers, ladder and rescue trucks.

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ANOTHER BIG CITY GOES GENERAL

One of five 750 G.P.M. pumpers now being delivered to the city of Dallas. This piece of apparatus is typical of General's complete line of fire trucks—trucks that communities all over the nation rely on for dependable efficient fire protection.

All over the United States, in large cities such as St. Louis, Kansas City, Minneapolis, Detroit, Dallas, and Cleveland, as well as in small communities and rural areas, General Fire Trucks are rated "tops" by the men who use them.

There is a reason for this popularity. General's location in the heart of the Motor City enables us to keep abreast of the latest designing and manufacturing improvements, and adapt these developments to Fire Truck use. General was the first to introduce many improvements that have since become standard in fire truck construction.

Whatever your requirements, there is a General Fire Truck to meet your needs. Like all General fire-fighting apparatus, you will find they give top performance under fire.

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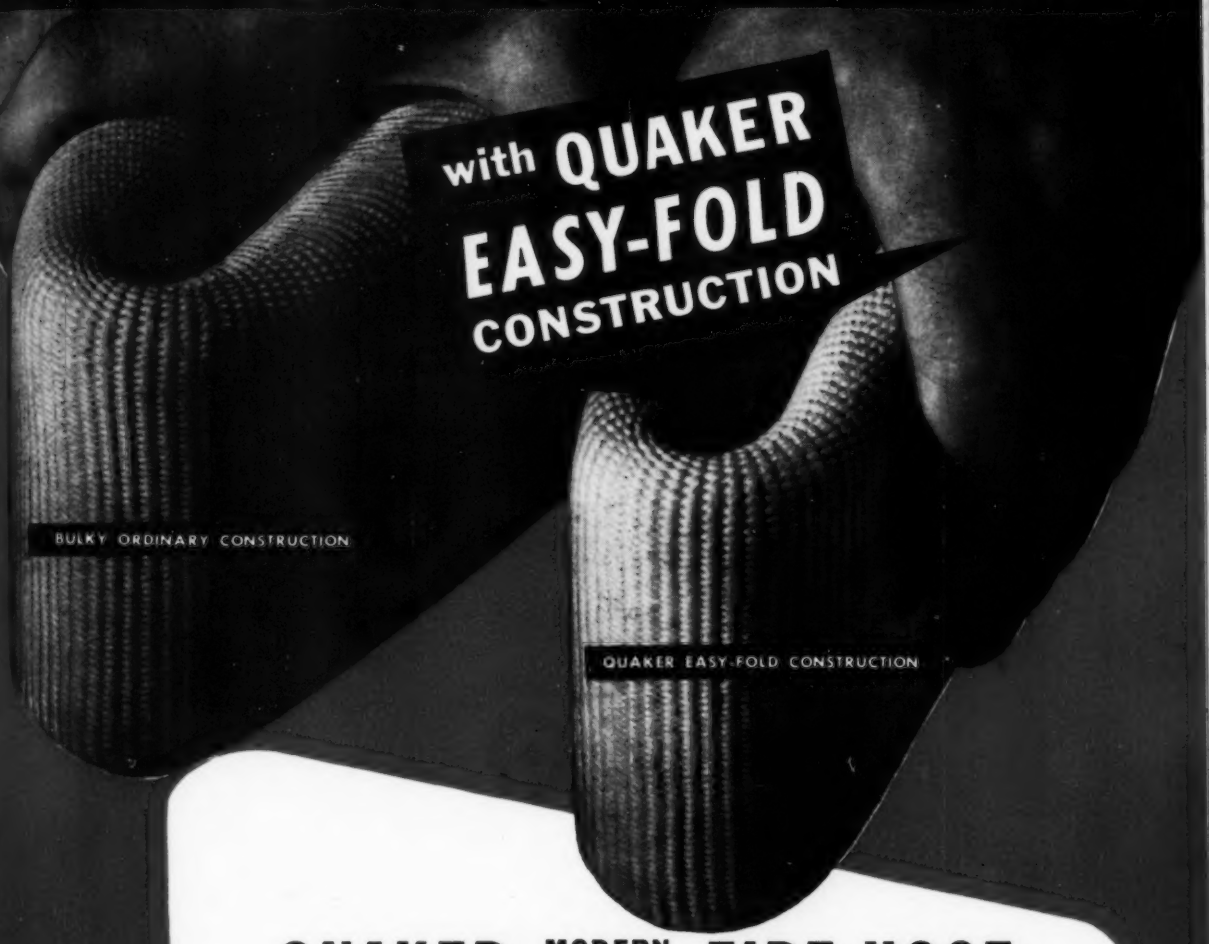

QUAKER MODERN MUNICIPAL FIRE HOSE

folds flatly . . . allows 33% more footage in trucks

Yes—with Quaker easy-fold construction you get greater flexibility, flatter folding, more compact storage without sacrificing ruggedness or long service. That's because it is designed and made by Quaker specialists to fold flatly, easily, quickly.

When minutes mean lives, fire fighters have extra fighting power with ⅓ additional footage to reach the high, out-of-the-way spots. You'll get longer-lasting security too, because Quaker Hose is made to resist constant abrasion, high pressure, hard usage.

Cities, communities, industrial plants will find top dependability, greater economy with Quaker Modern Municipal Fire Hose. Order a supply soon for safety's sake.

"IF THERE IS A WAY TO GET IT DONE . . . QUAKER WILL DO IT"

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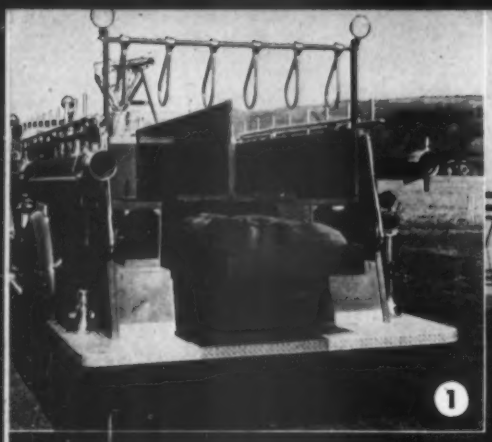
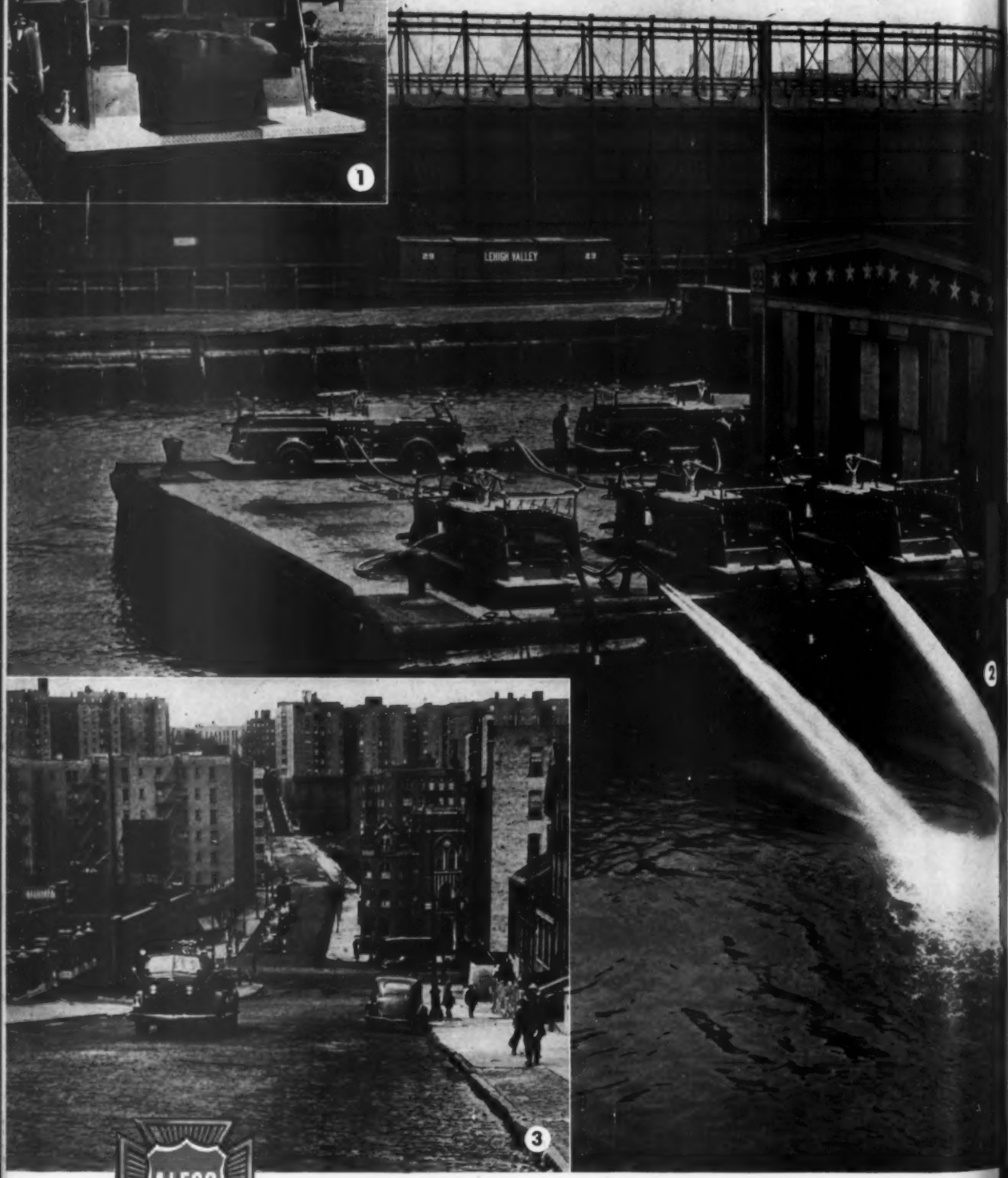




ALFCO

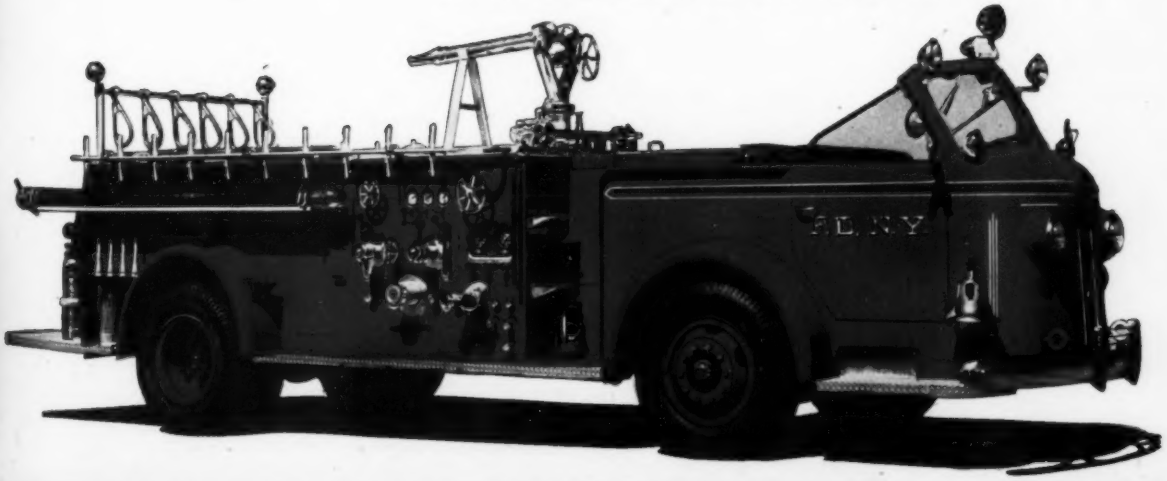
1. Rear view of New York City pumper showing hose body arrangement and life net mounting
2. Five of the pumpers on pump acceptance test
3. Pumpers undergoing acceleration and hill climbing test

TY JOINS THE GROWING LIST OF CITIES USING THE NEW

AMERICAN-LAFRANCE

CAB-AHEAD-OF-ENGINE-PUMPERS

TWENTY new 750 gallon American-LaFrance pumpers were recently tested and placed in active service by the New York Fire Department. The equipment test included 6½ hours of pumping at draft, (11' lift), 20 mile road test for acceleration, speed, hill climbing ability, and brake test. These new pumpers demonstrated the superior pump and road performance provided by this modern fire engine. See them in action in Madison Square Garden when the New York Fire Department stages the famous "Midnight Alarm" for the International Fire Chiefs Association Conference.



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A lighted match *will not* start a fire on FLAMEFOIL fabrics because they are protected by a patented* finish that penetrates every fibre.

These are your FLAMEFOIL Guardsmen, a coordinated corps of versatile fire guards, ready for many duties. These are a few of their assignments:

FLAMEFOIL CANVAS . . . This first quality canvas is performing great safety work in awnings, tarpaulins, canopies, welding curtains, burners' and painters' drops, machinery covers, protection for inflammable supplies and equipment. What is more it is mildewproof, water and weather resistant.

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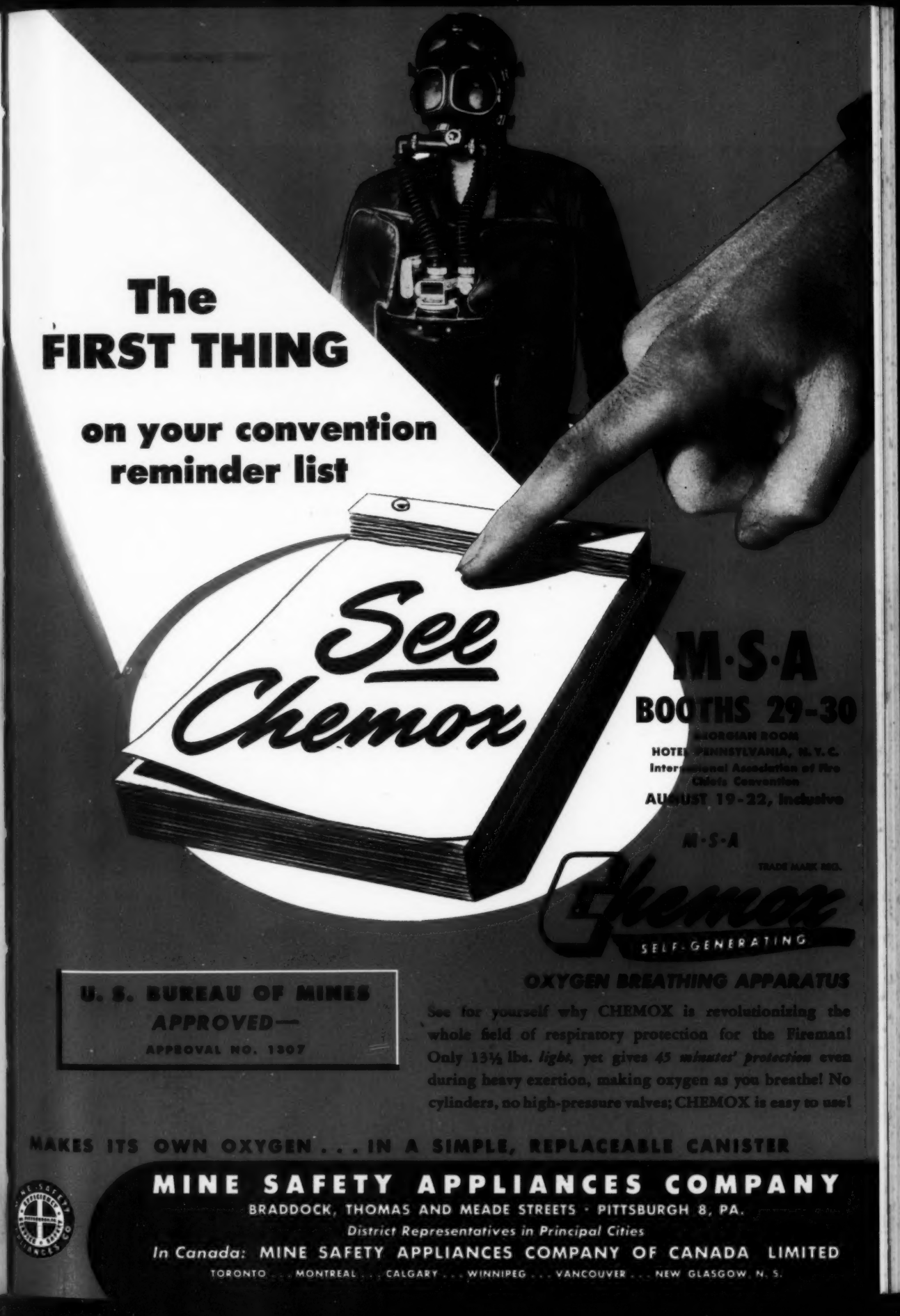
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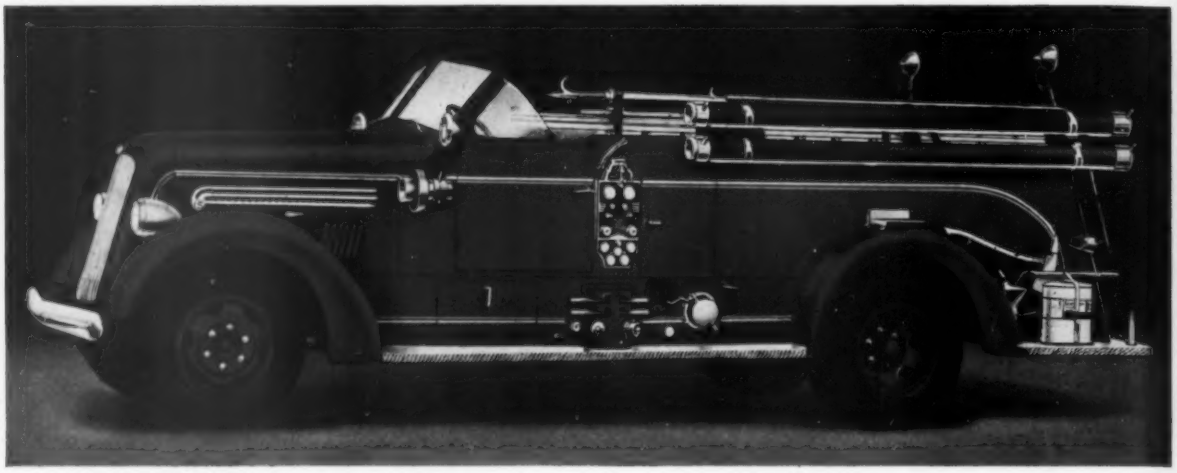

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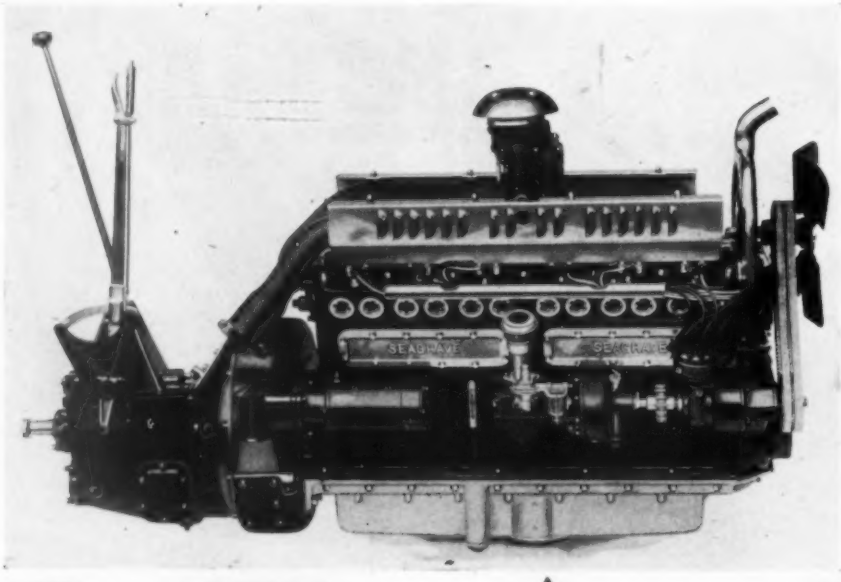

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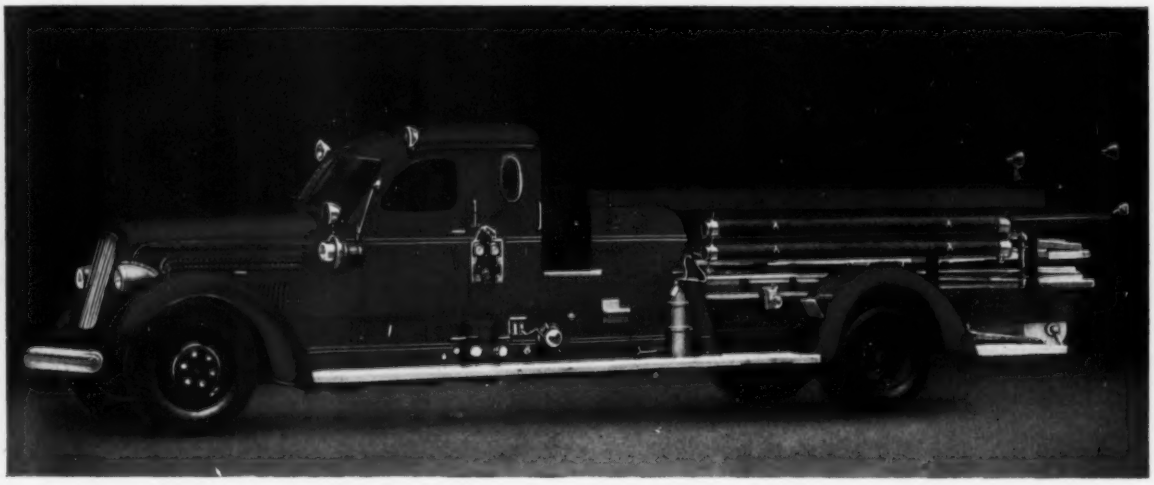

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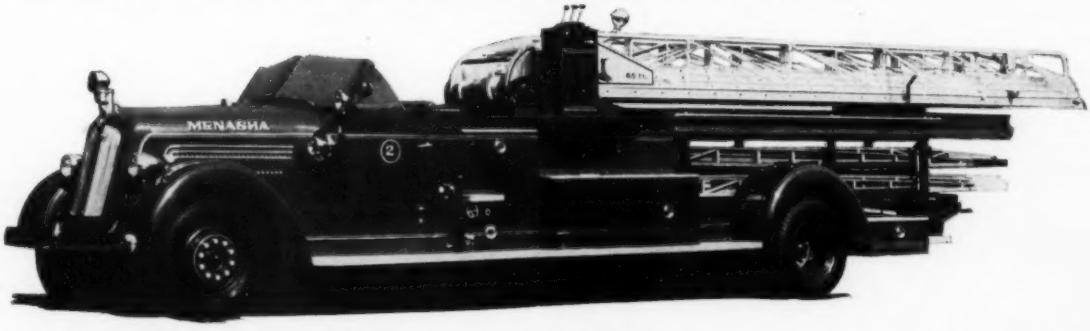

SEAGRAVE AERIAL LADDERS—The final word in Aerial Ladder Trucks with all steel aerial ladder of welded construction, safety locks on each extension section, full automatic throttle conrol, 100% hydraulic operation, one-man control. Made in open models and also with seven-man canopy cab.

THE SEAGRAVE CORPORATION, COLUMBUS, OHIO
Bickle-Seagrave, Ltd., Woodstock, Ont.

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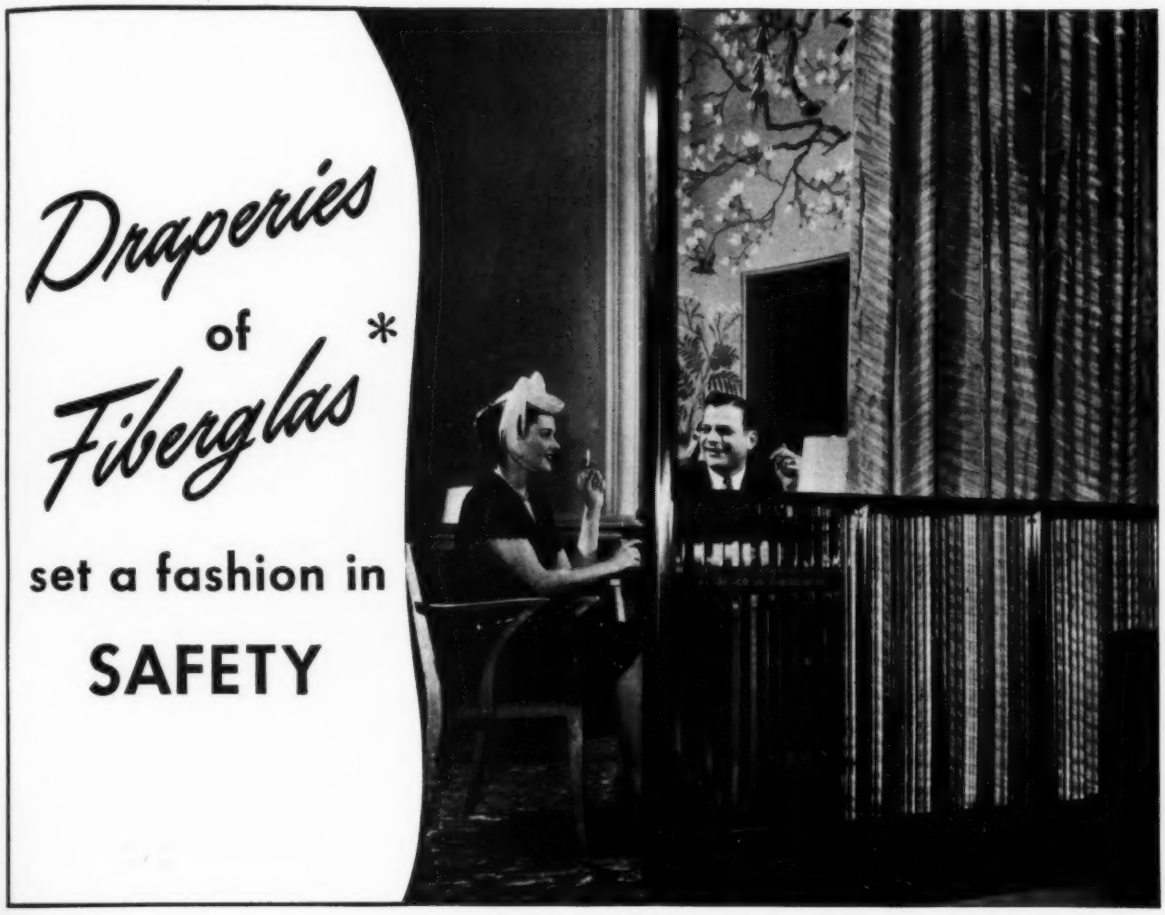

Fires can't start or spread in noncombustible* hangings

Serious fires usually result from the rapid spread of flames through materials that *can* burn.

Now, replace an inflammable material with one that *can't* burn—*and you eliminate a fire hazard.*

Decorative hangings woven from Fiberglas Yarns can't burn. They're *glass.* They're *originally* and *permanently noncombustible.* Furthermore, in the midst of fire or searing hot blasts, these fabrics of Fiberglas will not contribute to the further depletion of oxygen, will not give off suffocating smoke and fumes.

Their safety features, together with colorful appearance, account for the hundreds of installations already made in places of public assembly from coast to coast.

Fire marshals, fire chiefs and building officials will be interested in other developments in the direction of firesafety in hotel guest rooms. Manufacturers of mattresses and pillows are utilizing the noncombustible characteristic of Fiberglas fibers in ticking woven from Fiberglas Yarns and filling of resilient Superfine Fiberglas.

Make it a point to see these products at the Fiberglas display—Booths 27 and 28 in the Georgian Room, Hotel Pennsylvania—during the convention of the International Association of Fire Chiefs in New York City, August 19-22, 1947 . . . or write Owens-Corning Fiberglas Corporation, Department 993, Toledo 1, Ohio.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario

*Listed by Underwriters' Laboratories, Inc., "Noncombustible Fabric".

***FIBERGLAS is the trade mark (Reg. U. S. Pat. Off.) of a variety of products made of or with glass fibers by Owens-Corning Fiberglas Corporation.**

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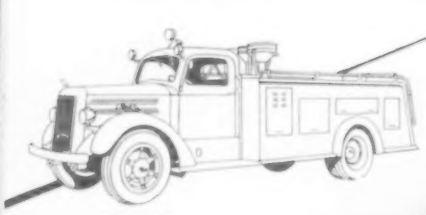
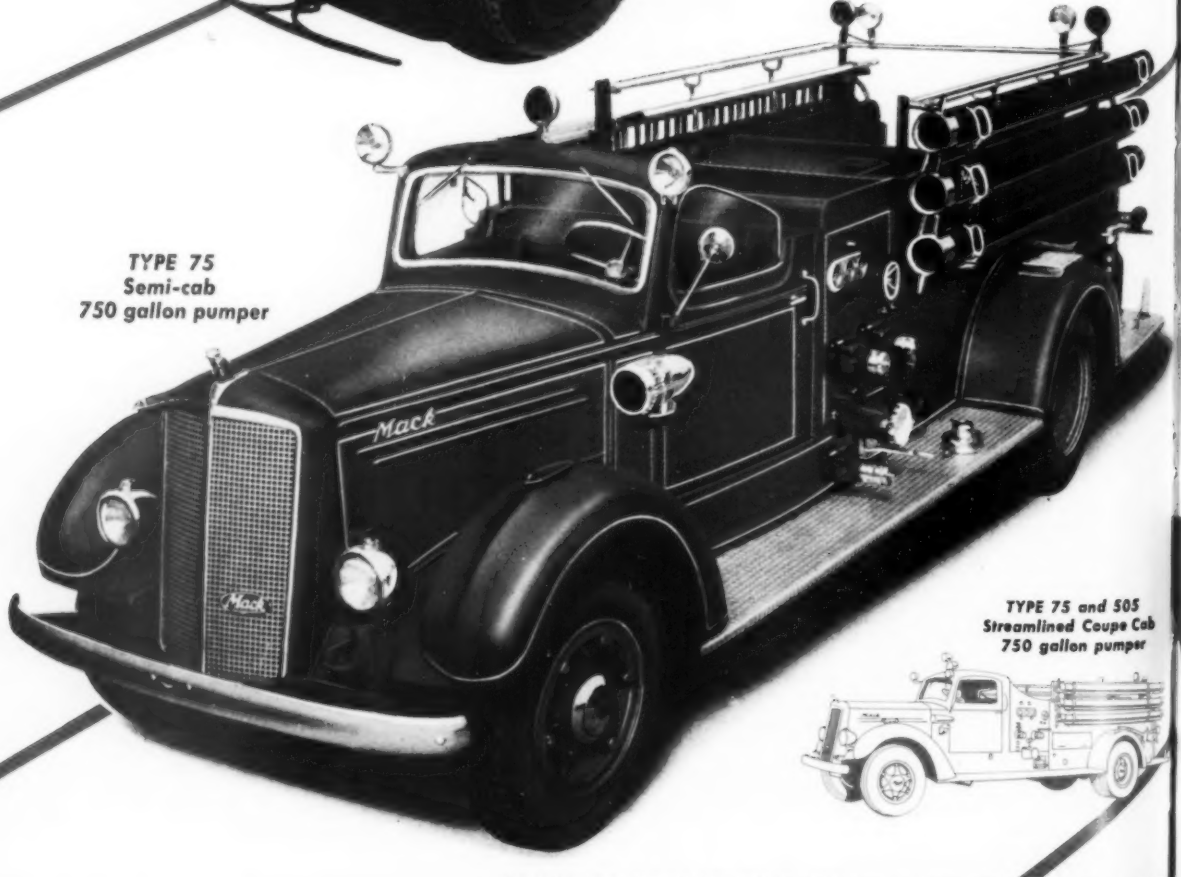
For Performance . . . For Reliability . . .

Modernize *with* Macks!



TYPE 45
Coupe Cab
Squad Car

TYPE 45
Standard Body
500 gallon pumper



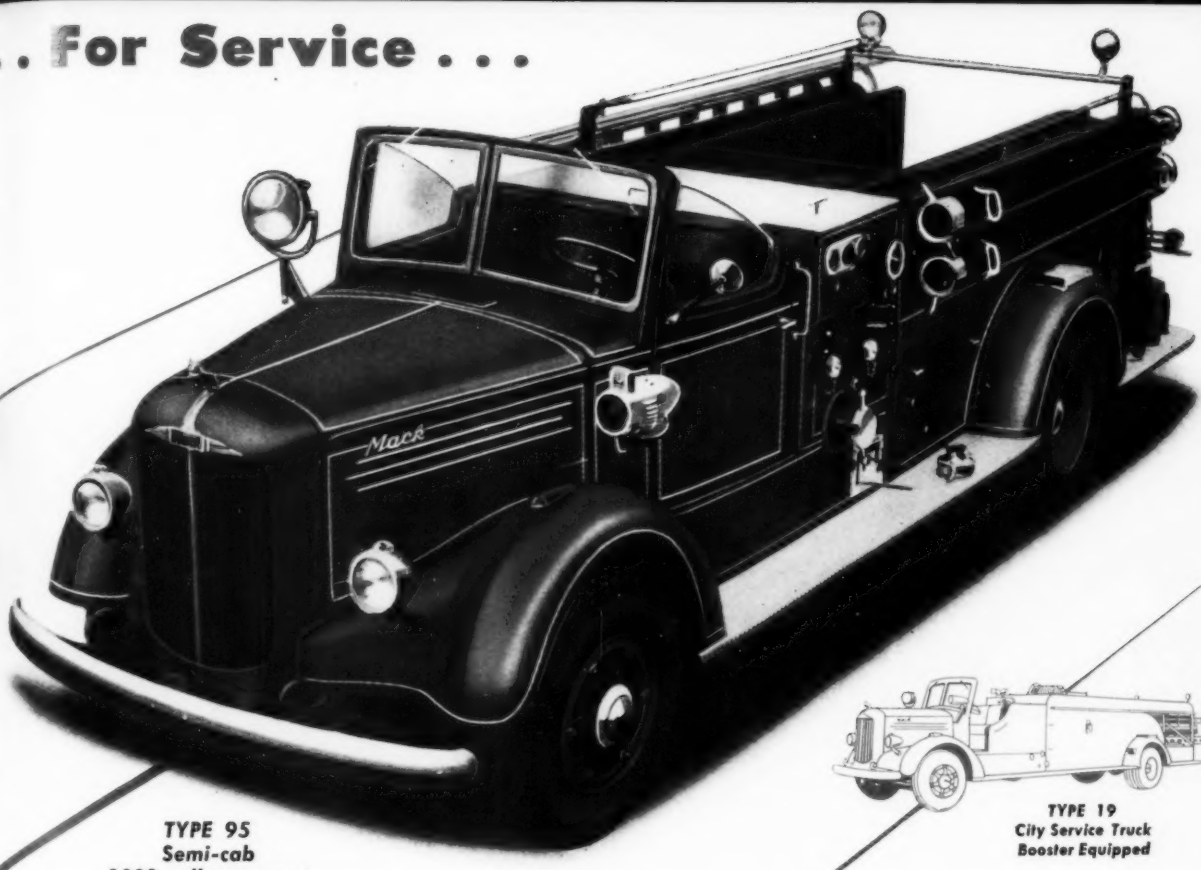
TYPE 75
Semi-cab
750 gallon pumper

TYPE 75 and 505
Streamlined Coupe Cab
750 gallon pumper

TRIPLE COMBINATION PUMPERS — 500 TO 1250 GALLONS

5279

. . . For Service . . .



TYPE 95
Semi-cab
1000 gallon pumper

TYPE 19
City Service Truck
Booster Equipped

TYPE 85
Canopy or Sedan Cab
750 gallon pumper

● From coast to coast — in over 1,000 departments — Mack firefighters are delivering the kind of reliable performance that has made Mack apparatus famous for 37 years. Mack leadership is maintained through resources which permit constant improvement... through extensive laboratories...facilities for highest quality construction...progressive engineering ...broad experience in fire apparatus manufacturing since 1910. In addition, every investment in Mack equipment is protected by the nationwide network of 67 Mack factory branches and over 600 authorized dealers, a ready source of skilled service and parts. Whether your department is large or small, there are precision-built modern Macks suited for your purpose.

Mack

Fire Apparatus

MACK MANUFACTURING CORPORATION
Fire Apparatus Division
Long Island City 1, N. Y.

Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

SQUAD CARS . . . CITY SERVICE AND QUADRUPLE COMBINATION LADDER TRUCKS

EMERGENCY
Flame Cutting Outfit . . . by VICTOR

here is the most compact, portable oxy-acetylene emergency flame cutting unit developed during the war years. this pack type cutting unit is ideal for railroad yards, fire departments and rescue squads. it is packed in a neat metal container and can be provided with spare cylinder units also carried in metal containers.

sold by victor distributors from coast to coast. write to the victor distributor nearest you for details.

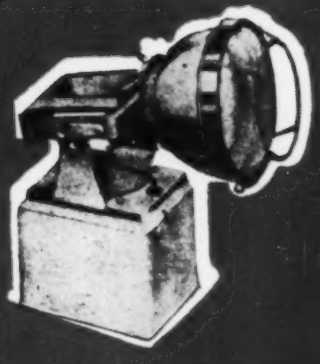
preset oxygen and acetylene regulator pressure merely requires opening of cylinder valves and lighting of torch—instant operation in an emergency.

victor equipment company

844 folsom st., san francisco 7, calif.

Ad 187

"CARPENTER-LIGHTS" for Every Emergency



SEARCHMASTER

WS—For the Chief—Type WS Highest Quality 8" diameter Rechargeable Searchlight and Floodlight. See-A-Mile range, patented handle (Beam tips upward at will without "cocking" arm), corrosion proof, featherweight, super capacity battery, height 13", weight only 11 lbs. Finest made.

MINUTEMAN

AUTOMATIC MASTER-FLOODLIGHTS Theatres, Auditoriums, Restaurants, Roadhouses, Factories, Stores, Loading Docks, Lodges and key position rooms. MEET STATE AND CITY LAWS.

SAVE LIFE AND PROPERTY where continuous light must be maintained. When usual lighting fails, Minutemen instantly illuminate. Special rechargeable battery

PORTA-LITE

Type PS—Uses drycell Hotshot type battery. Powerful as the WS, 6" diameter. Type Super-6 is like PS but has rechargeable battery in box like WS. Rechargeable batteries save money if lights are in frequent use.

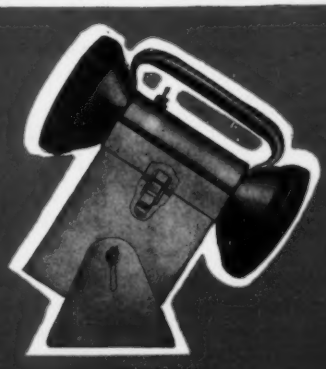
DRY AND RECHARGEABLE TYPES

"CARPENTER-LIGHTS"

WIG-WAG RED HEAD

OSCILLATING BEAM WIG-WAG RED-HEAD—6" and 8" diameter sizes. Put one on every emergency car or truck. The Powerful red light Wig-Wags its oscillating warning for ahead and CLEARS YOUR SIDE OF STREET, TOO. Makes safer, faster, quieter runs.

FLASH 'N' WAG



DUAL LIGHT

Type DLT 2-WAY. Uses two No. 6 or telephone type dry cells. Sturdy rust-proof steel case. Focusing white 1/3-mile beam searchlight or set in street for red warning.

Write for your
Emergency Lighting Bulletin

WATCHMAN

FOR THE MEN-TYPE G-32 Watchmen and Firemen. (Saves up to $75 in dry batteries yearly.) Lightest made (76 oz.). Longest burning and brightest. Insert spare refill and corrosion proof battery with automatic filling control in 10 seconds. Third-mile range.

USED BY FIRE DEPARTMENTS EVERYWHERE

Your 1947 replacements are not complete without CARPENTER-LIGHTS. Write for catalogs and prices or order thru Fire Equipment Houses.

"MASTER-LIGHT-MAKERS"

CARPENTER MFG. CO., 200 Master-Light Bldg., Boston 45, Somerville, Mass.

WHEN SPEED IS ESSENTIAL
USE BWH HOSE

When fires rage and every minute counts, fire fighters need hose that is easy to handle and has dependable stamina. That's one reason why so many municipalities call on *General* for BWH Fire Hose.

A fine example of BWH Manufacturing is Boston Fire Jacket Hose. Highly flexible, this hose has the stamina that takes real punishment. The strong rubber tube is protected by a circular woven cotton jacket, with individual threads 30% heavier than those used in many other types of hose. No wonder this BWH Hose is the choice of fire fighters who want the best.

Boston Fire Jacket, as well as all types of Fire Hose, is available to you through *General's* conveniently located 21 branch offices and warehouses, plus a nation-wide network of independent distributors. There's one near you. Call or write him today.

Boston Fire Jacket Hose

NOW! *Distributors of famous*
BOSTON WOVEN HOSE AND RUBBER CO.
Municipal Fire Hose

THE GENERAL DETROIT CORP.
Manufacturers of Fire Extinguishers
Motor Fire Apparatus and Allied Equipment
2270 E. JEFFERSON • DETROIT 7, MICHIGAN
NEW YORK • PHILADELPHIA • ATLANTA • CHICAGO • DALLAS
West Coast Subsidiary: The General Pacific Corp.
LOS ANGELES • SAN FRANCISCO • DENVER • SEATTLE
Distributors in Principal Cities

OFFICIAL RECORDS PROVE . . .

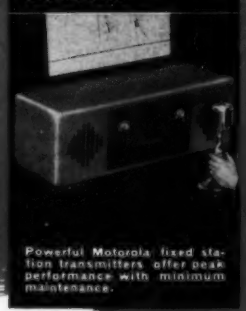
FEWER BREAKDOWNS

WITH Motorola 2-WAY FM RADIOTELEPHONE EQUIPMENT

than with any other!

● Yes, it's a proved fact—the many oversize components, the quality and craftsmanship that go into Motorola communications equipment make it *last longer.* Hundreds of reports show that on Motorola equipment in use six years or more no major repairs have been made and minimum routine maintenance is all that is required.

Even using long life oversize components compact Motorola mobile units require very little space.



Powerful Motorola fixed station transmitters offer peak performance with minimum maintenance.

Motorola console transmitter and receiver . . . compact attractive . . . dependable.

ONLY Motorola 2-WAY FM RADIOTELEPHONE

Can prove all these advantages

1. Motorola-patented FM squelch system. The only system that permits full communications range with squelch control.
2. A pioneering receiver design with sensitivity crowding the theoretical limit for noise reduction and with selectivity better than proposed RMA specifications.
3. Automatic volume control for modulation limiting in transmitters.
4. Coordinated microphone, modulator, receiver-audio and speaker to provide the "Golden Voice" of communications systems.
5. Generous size of equipment and components assures longest life, highest efficiency and lowest maintenance cost.
6. Flexibility of design permitting the use of a variety of power supplies.
7. Mobile antennas designed by engineers who know the problems of automobile ignition control. Shielded antenna base of maximum ignition noise control.
8. Heavy duty cables to minimize battery drop. Dust covers that really exclude dirt.

BELL TELEPHONE USES Motorola 2-WAY FM RADIO TELEPHONE TO ROUND OUT ITS NATIONWIDE SERVICE

In many cities where the Bell System is offering mobile telephone service, Motorola transmitting and receiving equipment is being used.

WRITE TODAY . . . Motorola engineers will make specific recommendations concerning your application. No obligation, of course. WRITE TODAY

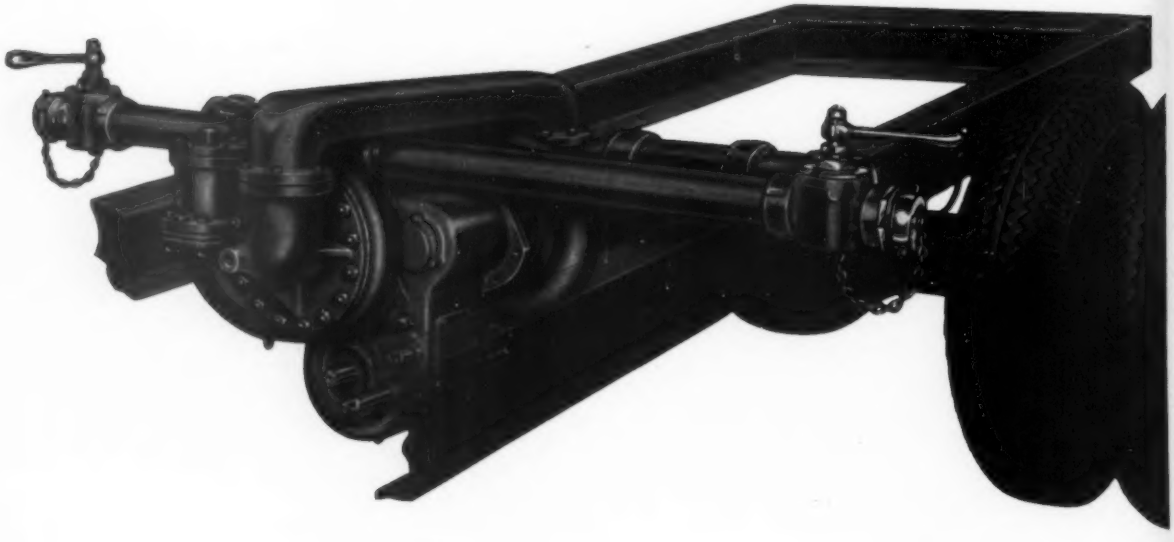
Motorola Inc. COMMUNICATIONS-AND ELECTRONICS DIVISION

CHICAGO 51, ILLINOIS • IN CANADA: ROGERS AND MAJESTIC LTD., TORONTO-MONTREAL

BARTON-AMERICAN

DUPLEX-MULTISTAGE, CENTRIFUGAL, FIRE PUMP

The Only Pump With Three Operating Characteristics



• LOOK AT THESE IMPORTANT FEATURES •

• Barton-American, Duplex-Multistage, Centrifugal, Midship Mounted Fire Pumps are different. It is the only fire pump with three distinct operating characteristics and two independent pumps. This results in larger capacities and higher pressures at lower engine speeds.

• Pressure Operated Valves—eliminate troublesome manually operated valves used on conventional series-parallel units and reduce operation to merely the shifting of a lever.

• The Duplex-Multistage feature makes it possible to operate one or more high pressure "fog" guns at engine speeds equivalent to approximately 35 Miles Per Hour at pressures of 350 to 400 pounds.

• A quarter of a century of experience in building fire pumps has gone into this pump.

To better understand this DUPLEX MULTISTAGE principle we invite you to visit Booths 39 and 40, at the Convention, and see the cut-away model in operation.

AMERICAN-MARSH
PUMPS • INCORPORATED
BATTLE CREEK, MICHIGAN

AMERICAN-MARSH PUMPS

We shall appreciate your mentioning FIRE ENGINEERING *when writing advertisers*

DUO Safety

all Aluminum Fire Ladders

FOR PUMPER USE

Duo-Safety offers the very finest in fire ladder equipment. Designed especially for pumper use is the 700A series, featuring CHANNEL RAIL construction. Extra lightness, extra strength, are combined in this great ladder to promote the utmost in safety and convenience. All the latest improvements in ladder design are incorporated to produce a ladder which meets fire departments' requirements for strength, lightness and value.

THREE SECTION Series 725-A

THREE SECTION SERIES 525-A

FOR SERVICE TRUCKS

Only in Duo-Safety all-aluminum fire ladders is the added strength of TUBULAR CONSTRUCTION available. The 500A Series goes beyond ordinary safety features to provide perfection of ladder design and extraordinary strength without cumbersome weight. Duo-Safety's famous 500A Series fire ladders for service trucks have been adopted as standard equipment by fire departments everywhere. It's a truly exceptional ladder . . . for safety . . . for light weight with great strength . . for economy.

COMPLETE FILE AVAILABLE

Write today for free, colorful file describing Duo-Safety's complete line of wood and aluminum fire ladders

DUO-SAFETY LADDER CORP.

609 Ninth St. Oshkosh, Wis.

The DUAL FIRE FIGHTER

GETS WATER TO THE FIRE *Quickly*

- Relays Water to the Truck Pumper
- Fights Fires Direct . . . . .

Valuable for dewatering purposes
Saves costly damage to truck pumper

Ask for bulletin FD-3 for complete information.

THE GORMAN-RUPP COMPANY
MANSFIELD • OHIO

SOLD COAST to COAST BY THESE DEALERS

AMERICAN FIRE EQUIP. CO., *Boston*
ANDERSON FIRE CONTROL CO., *Sioux City*
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LIBERTY FIRE APPARATUS CO., INC., *Roanoke, Va.*
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THE LANG CO., *Salt Lake City*
CLARENCE W. LEWIS *Grimsby, Ont.*
JUSTIN A. McCARTHY CO *Boston*
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60 seconds to go...then OUT by AER-O-FOAM!

A gasoline tank blazing away...

30 seconds...after Aer-O-Foam application.

60 seconds...OUT to STAY OUT.

THAT'S the kind of fire-fighting effectiveness that has made NATIONAL Foam the standard method for fighting oil fires in the petroleum industry for years.

NATIONAL Aer-O-Foam, a *non-corrosive* mechanical foam, quickly forms a thick, tough, lasting blanket that smothers a fire . . . insulating threatened areas and preventing flashbacks. It flows quickly and clings fast even to vertical surfaces . . . will form a fog-foam if required. Aer-O-Foam will not harm machinery . . . can be cleaned off equipment, walls and floors.

For a simple, dependable means of applying Aer-O-Foam, NATIONAL has developed its "RP" Type Nozzles, easily handled by one man. These nozzles, provided with pick-up tubes, deliver a spot pattern stream, with no weeping.

Let us know your problem . . . we'll offer specific protective measures.

NATIONAL FOAM SYSTEM, INC.

Specializing in Foam Fire Protection

Packard Building, Philadelphia 2, Pa.

CHIEF, SAVING LIFE IS *YOUR* RESPONSIBILITY

EVERY FIRE DEPARTMENT SHOULD USE

DAVY *Automatic* FIRE ESCAPE

The "DAVY" is an absolute necessity in every fire department! It saves firemen - saves time - saves effort - saves lives! Just hook it to a ladder rung - put strap around the victim - that's all there is to it. It lowers the person (child or adult) at about two feet per second - safely - while another strap is waiting for the next person to be lowered. It will lower five persons in less time than it takes one fireman to climb a ladder and bring back one victim. Where persons are hysterical or unconscious, the "DAVY" eliminates carrying them down ladders.

The "DAVY" is *100% automatic* — requires no manual manipulation. There is no upkeep - it will not deteriorate - needs no mechanical adjustments - will not get out of order. The brake mechanism is sealed in a round container about 6" by 2", with steel-cored cord neatly coiled below the container. Will carry three people from 3rd or 4th floors in about one minute. Carries one person from 20th floor in about a minute. A strap at each end means the "DAVY" is ready to lower another person as soon as the first one reaches the ground, and so on until all persons are rescued.

DAVY'S HAVE BEEN IN SERVICE FOR OVER 40 YEARS.

The model shown in the photo above is exactly like fire dept. model except it fastens on the window frame of room. This model should be recommended by fire inspectors for every hotel, rooming house and institution in town.

• DEALERS •

Fire Depts. everywhere are in immediate need of the "DAVY" Automatic FIRE ESCAPE. Sell one model to all fire depts., sell another model to hotels, etc. Write for dealer proposition.

DAVY AUTOMATIC FIRE ESCAPE CO.

COLVIN STATION BOX 51 **SYRACUSE 5, N. Y.**

We shall appreciate your mentioning FIRE ENGINEERING *when writing advertisers*

Pathfinder Model with All Steel 3-4 Man Cab
500 gal. 2 Stage Centrifugal Pump, Large Booster
Tank and full Accessory Equipment.

BUFFALO FIRE APPLIANCE
CORPORATION
44 CENTRAL AVENUE, BUFFALO 6, N. Y.

FIRE APPLIANCE CORP. BUFFALO, N.Y.

ALL WE HAVE CLAIMED . . . AND MORE

Fast action, minimum water damage, and complete extinguishment on all types of fires—

All these claims and more have been proved by hundreds of FMC High-Pressure Fog Fire Fighters now in use.

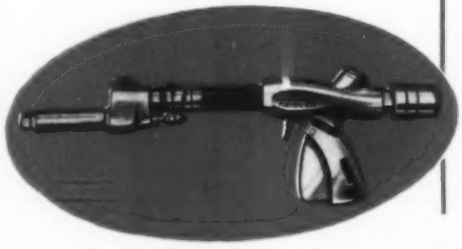
Nothing else like it

Users of FMC units tell us there's nothing else like it! You arrive at the fire ready to go to work. FMC High-Pressure blasts, cools and smothers flame—and FMC units do the job with much less water than other systems.

That means you reduce fire losses two ways: *First,* by quick extinguishment; *Second,* by cutting down water damage.

You owe it to the people you protect to investigate FMC High-Pressure for your department. Get the facts.

UNDERWRITERS' LABORATORIES APPROVED



ONE MAN CAN HANDLE the patented Bean fog fire gun. Provides every type of fog pattern —everything you need for high pressure work.

PROOF

STEVENS POINT, WISCONSIN. *"We have made 441 runs since we received our high pressure truck. During that time we have laid a line to a hydrant just 9 times in two years, to supply water to our booster tank, as our tank holds only 150 gallons."*

• • •

BRIGHTON, MICHIGAN. *"We believe that we are extinguishing fires that could not possibly be managed with other types of equipment."*

• • •

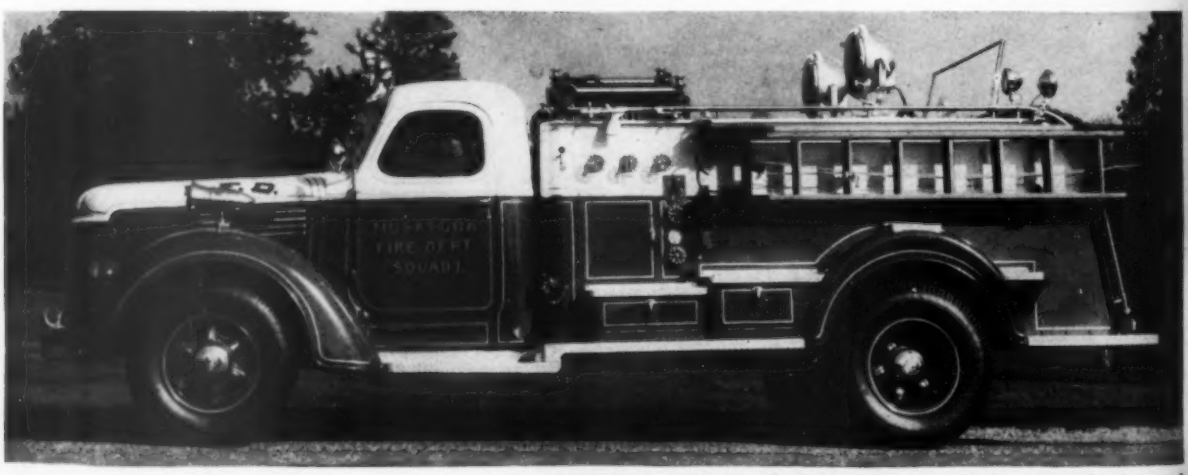
ROCK FALLS, ILLINOIS. *"High pressur used on 64 fires for a loss of $4,975.00."*

• • •

REDFORD TOWNSHIP, MICHIGAN. *"Forty eight fires in 1947 to date. All were extinguished with high pressure."*

• • •

KENT COUNTY, MICHIGAN. *"All types of fires—720 fire runs—recently add another Bean High Pressure truck, ma ing six Bean trucks in all."*



MUSKEGON, MICH. *Standard FMC Fog Fire Fighter recently delivered to Muskegon, Mich. Carries its own water supply—provides two guns of 30 gallons each—850 lbs. pump pressure—complete in every respect.*

FMC *Original* HIGH-PRESSURE FOG FIRE FIGHTER

CAN BE MOUNTED ON MOST STANDARD TRUCK CHASSIS

FOOD MACHINERY CORPORATION

JOHN BEAN MFG. CO., DEPT. 126, LANSING 4, MICH. • BEAN-CUTLER DIVISION, 409 JULIAN ST., SAN JOSE, CALIF.

BUILDERS OF BEAN HIGH-PRESSURE PUMPS FOR OVER 60 YEARS

Modern Equipment uses

MANHATTAN FIRE HOSE

Thousands of municipal, industrial and private fire departments have specified Manhattan Fire Hose on their modern equipment. Fifty years of reputation for the highest quality, assures buyers they will always get the best hose for their budgets at Manhattan. There are several grades of Manhattan Fire Hose for either light- or heavy-duty service.

All grades feature strong, balanced construction—are made flat-folding—easy to handle—are made to withstand a maximum of dragging and external wear, proving their ultimate economy for the service desired.

Safety is Sure—for *not one length* of Cotton, Rubber-Lined fire hose leaves the Manhattan factories until its strength and stamina are proved by test under pressure.

CHEMICAL ENGINE HOSE—Manhattan brands are used extensively by fire departments on chemical apparatus and in industrial plants. Available in duck plied hose in 50' lengths. Chemical-proof Flexlastics tube and abrasive resistant cover.

BOOSTER HOSE—Especially designed to stand up under severe service. Mandrel made—duck plied in 50' lengths.

FOAM HOSE—Developed for the growing use of foam apparatus and fire extinguishers. Heavy gauge, Flexlastic chemical-proof tube—mildew-proof duck plies—thick, long lasting cover—sealed ends—for long, safe usage.

SUCTION HOSE—Long recognized as standard, Flexible, withstands hard usage, resists collapsing.

Manhattan is making fast deliveries on current fire hose orders. Write for the name of your nearest Manhattan Representative.

Sole manufacturers of Radio-Active Treated Mildew-Proof Fire Hose.

FLEXLASTICS is an exclusive MANHATTAN trade mark. Only MANHATTAN may make FLEXLASTICS.

RAYBESTOS R M MANHATTAN

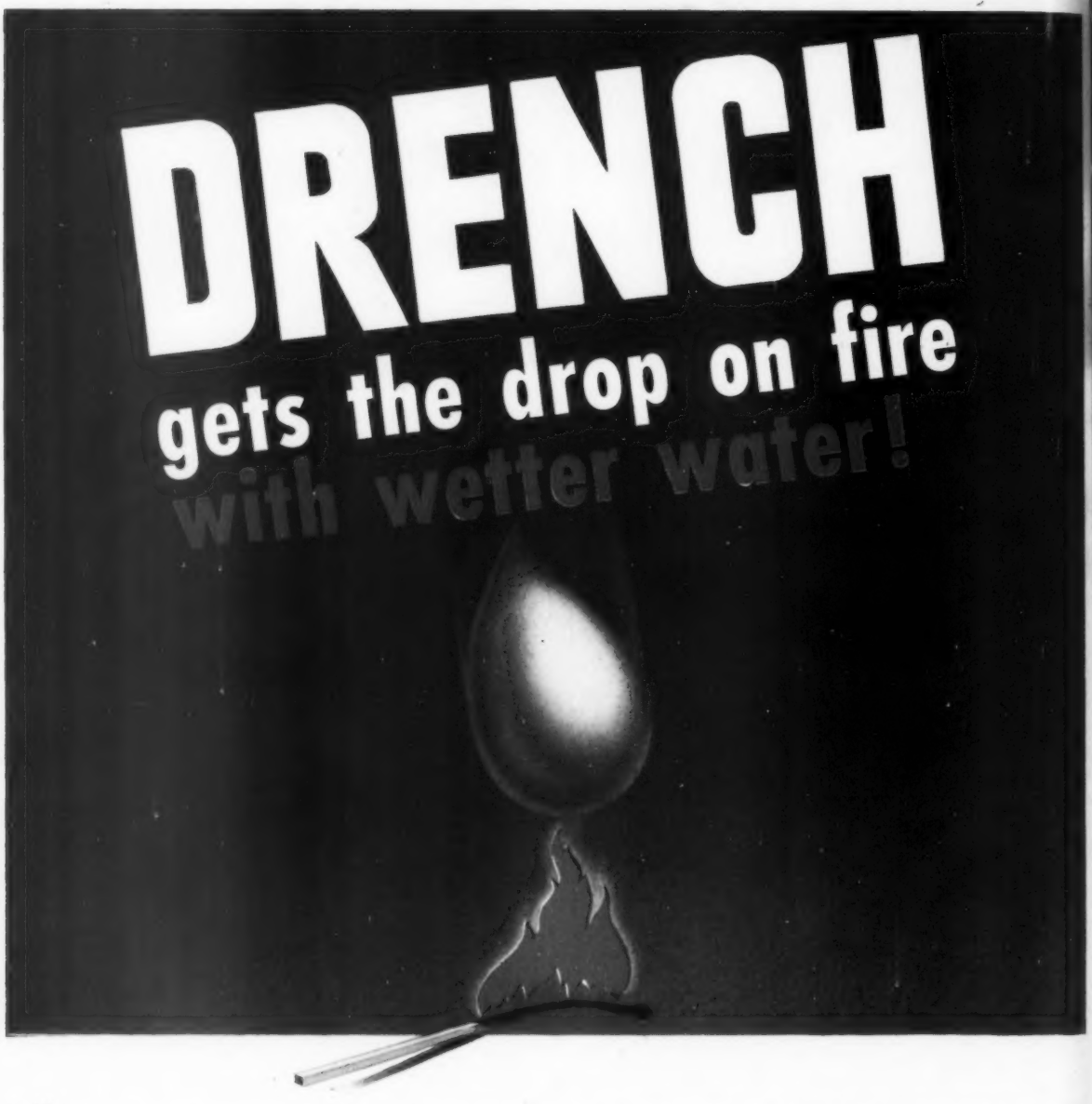
RAYBESTOS-MANHATTAN INC.

Keep Ahead with Manhattan

MANHATTAN RUBBER DIVISION PASSAIC, NEW JERSEY

DRENCH

gets the drop on fire with wetter water!



For faster, more complete fire extinguishing action, add Drench* to your water supply.

Yes, Drench makes wetter water . . . the most widely discussed advancement in the fire fighting industry. Tried and proved under actual fire conditions, Drench is the wetting agent that helps you fight fire faster, knock it down and keep it down.

Drench effectively changes the characteristics of water *without limiting its use or requiring special equipment.* Use it on all "Class A" fires and on oils with flash points over 100° F., with any type of nozzle equipment, including straight stream high and low velocity fog and high pressure fog nozzles. It leaves no harmful residue.

Join the hundreds of fire companies and departments who now use Drench in their portable equipment and booster tanks. Write us today for more information about Drench and how it will help you fight fire faster.

Ask your supplier for Drench the tried and proven wetting agent.

Do not use in Soda Acid Extinguishers or calcium chloride solutions.

DRENCH

*PATENT PENDING

ARNOLD-HOFFMAN & CO., INC.

Fire Specialties Division

PROVIDENCE, R. I.

Established in 1815 Plants at Dighton, Mass. and Charlotte, N. C.

NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE

We shall appreciate your mentioning FIRE ENGINEERING *when writing advertisers*

Chief POWHATAN

— again proclaims

"SENSIBLE LUG" COUPLINGS

BEST FOR NEW HOSE

Sensible in every sense of the word.

Sensible because they cannot catch in ladders, etc.

Sensible lugs are designed to glide over obstacles.

Sensible because they cannot wear or mar stacked hose.

Sensible because they are easier to couple up.

Sensible because they are made of sturdy brass.

And Again Presents the "SACHEM"

LEADER LINE SHUT-OFF NOZZLE

"SACHEM"—a tribal leader—and our "Sachem" leader line shut-off nozzle is truly a leader. It's the one shut-off nozzle you can order any time and rest assured you are getting the best nozzle you can buy.

We make and sell nothing but the finest Fire Equipment money can buy. For 54 years we have made brass goods of every description for fire departments in all parts of the country. Hundreds of fire chiefs can attest to the fact that our brass goods "stand the gaff."

Restrictions are lifted and we urge you to let us have your requirements now, to insure your getting whatever you need, without further delay.

Perfect Combination Play Pipe. Comes in 2½-inch size. Built to stand the gaff.

Sachem Leader Line Shut-Off Nozzle

POWHATAN BRASS & IRON WORKS

RANSON, WEST VIRGINIA

Phones 93 & 94 Charles Town West Virginia — Established 1892

This caused by This

But There's a Way to Prevent It!

Automatic Sprinkler Systems undoubtedly are the greatest single contribution ever made to fire protection. Yet without water even the most efficient sprinkler equipment is helpless in case of fire.

Closed shut-off valves and other conditions affecting the water supply and its distribution account for most of the destructive fires in sprinklered properties. Regardless of the number or frequency of inspections, there is always the possibility that a valve may be closed accidentally or maliciously *between inspections*. Valves often are closed while repairs are being made and then are left unopened.

ADT Central Station Sprinkler Supervisory and Waterflow Alarm Service provides the most effective assurance that sprinkler valves are kept open. By means of special electrical supervisory devices installed on the sprinkler system, closed shut-off valves and other abnormal conditions which might impair or nullify the effectiveness of the system are immediately and automatically reported to the ADT Central Station for prompt corrective action.

Waterflow Alarm Service makes the sprinkler system function as an automatic fire alarm, *automatically* summoning the fire department and other protective forces direct to the premises in the event of a fire or a serious leak.

May we tell you how this service can be applied to effect substantial economies while obtaining more complete and reliable protection? Write for descriptive bulletin "Assuring Sprinkler Efficiency."

ADT SPRINKLER SUPERVISORY AND WATERFLOW ALARM SERVICE

Controlled Companies of **AMERICAN DISTRICT TELEGRAPH CO.** *155 Sixth Avenue, New York*
CENTRAL STATION OFFICES IN ALL PRINCIPAL CITIES OF THE UNITED STATES

ADT

Electric Protection Services
AGAINST FIRE · BURGLARY · HOLDUP
A NATION-WIDE ORGANIZATION

INDIAN

FIRE PUMPS

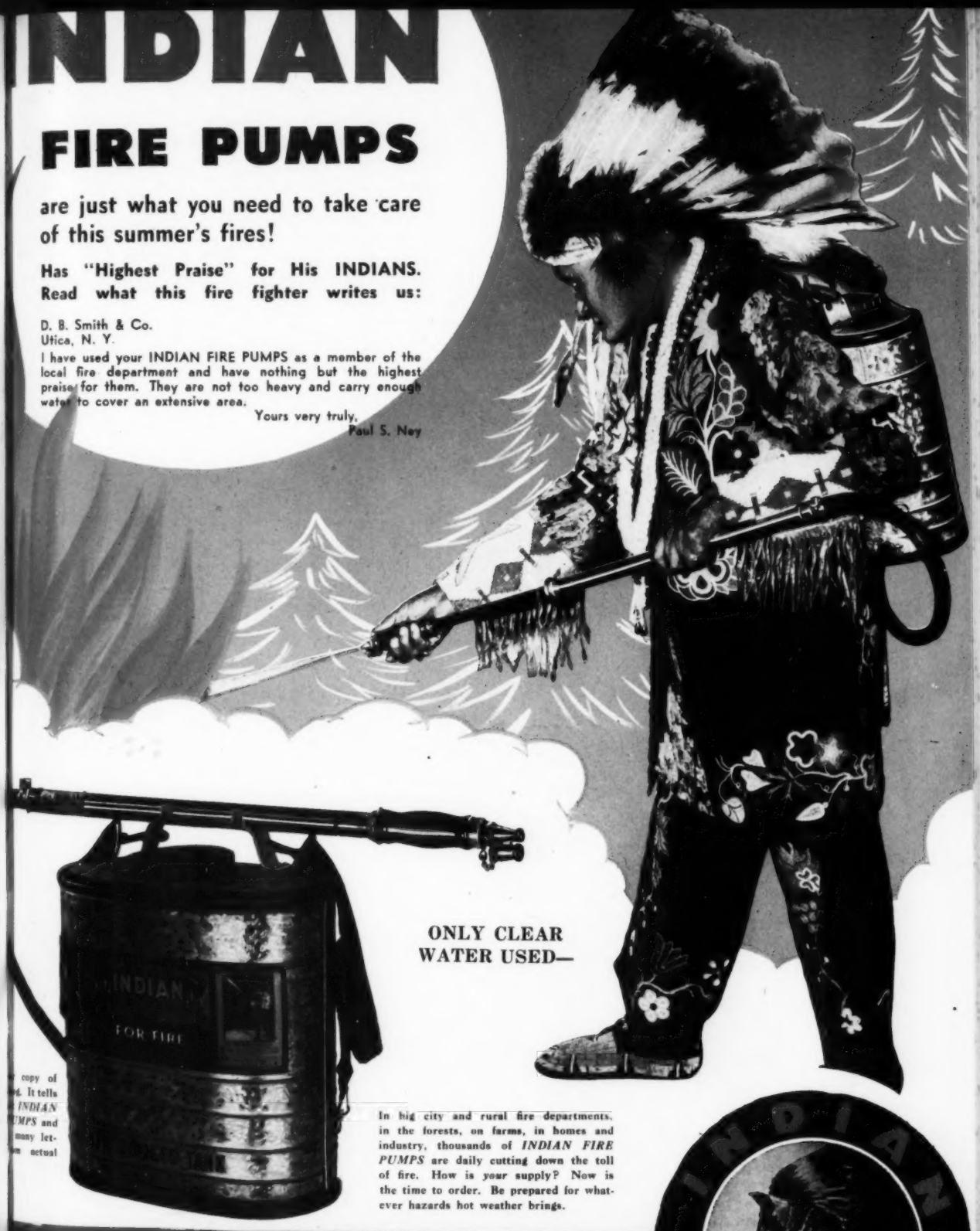
are just what you need to take care of this summer's fires!

Has "Highest Praise" for His INDIANS. Read what this fire fighter writes us:

D. B. Smith & Co.
Utica, N. Y.

I have used your INDIAN FIRE PUMPS as a member of the local fire department and have nothing but the highest praise for them. They are not too heavy and carry enough water to cover an extensive area.

Yours very truly,
Paul S. Ney



ONLY CLEAR WATER USED—

copy of
d. It tells
INDIAN
MPS and
many let-
m actual

In big city and rural fire departments, in the forests, on farms, in homes and industry, thousands of *INDIAN FIRE PUMPS* are daily cutting down the toll of fire. How is *your* supply? Now is the time to order. Be prepared for whatever hazards hot weather brings.

INDIAN FIRE PUMPS

B. SMITH & CO. 406 Main Street UTICA 2, N.Y.

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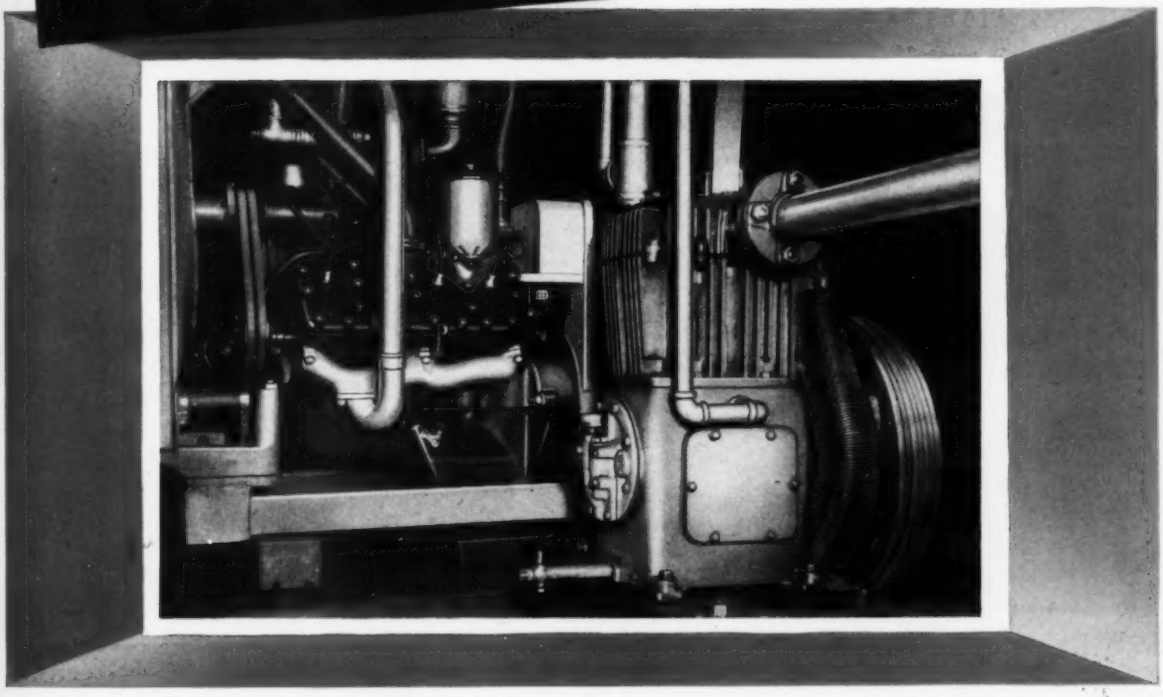

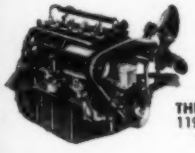

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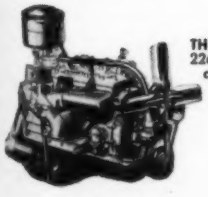

THE 90-H.P. SIX
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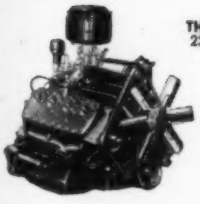

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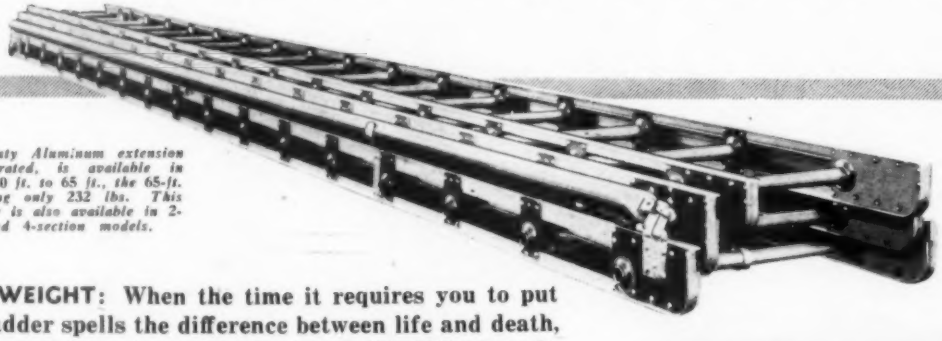

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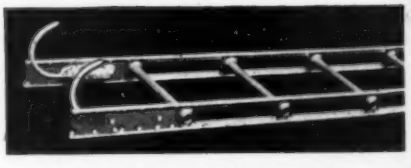

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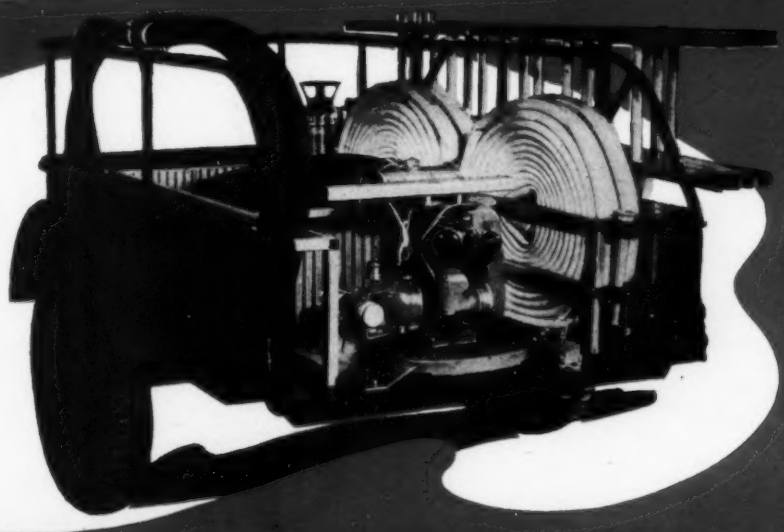

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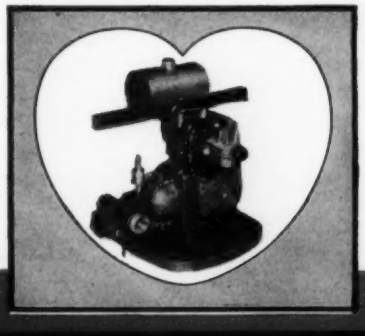

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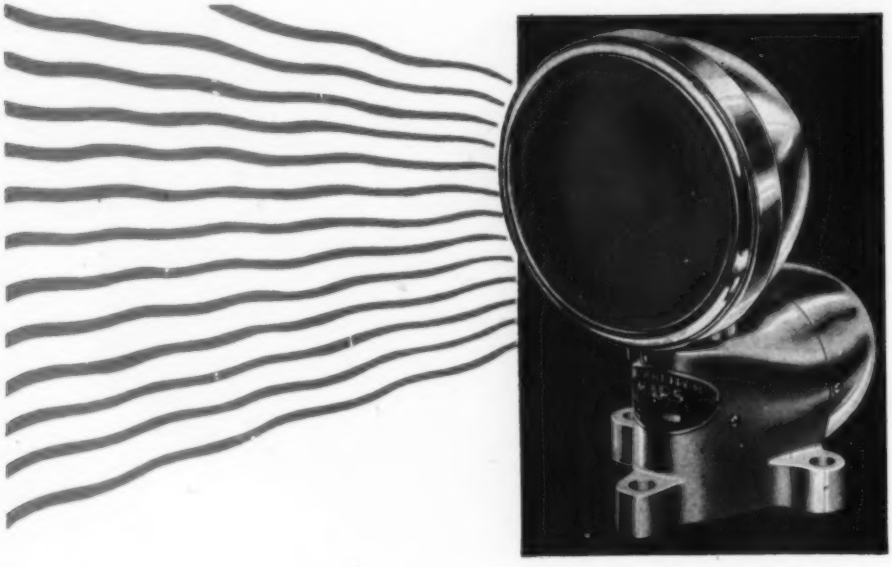

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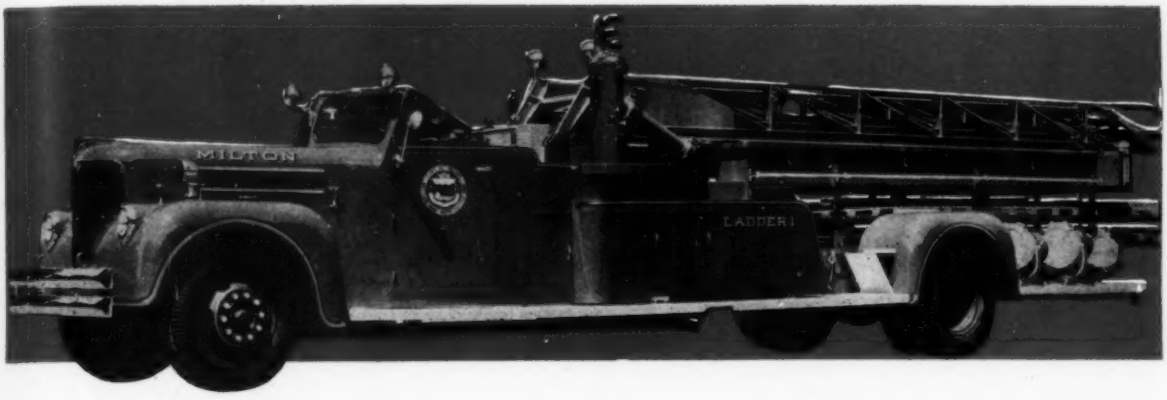

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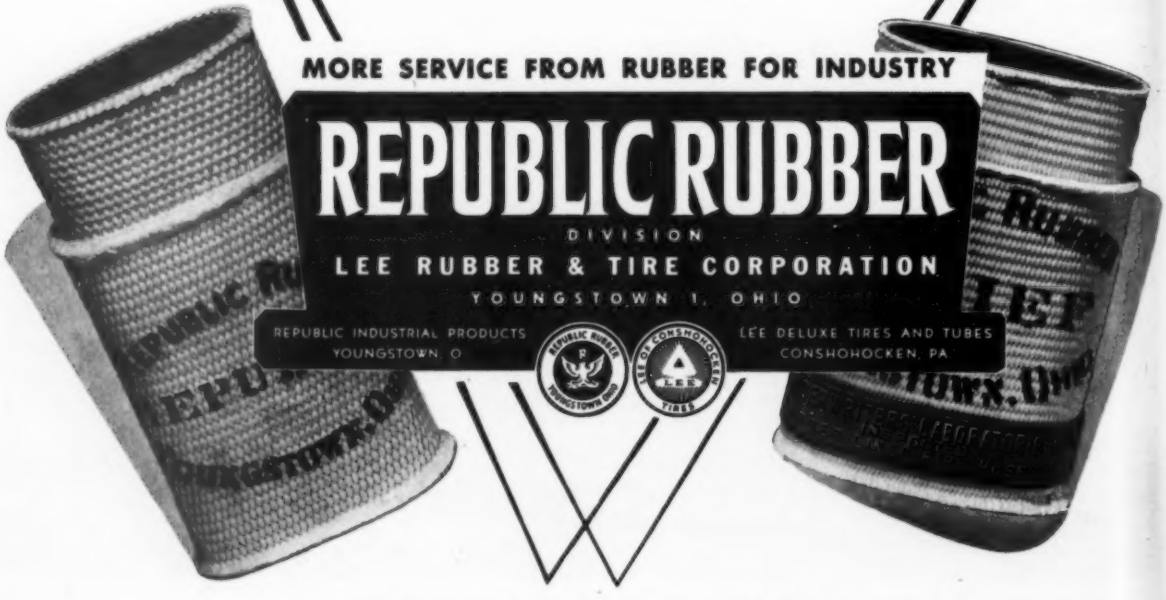

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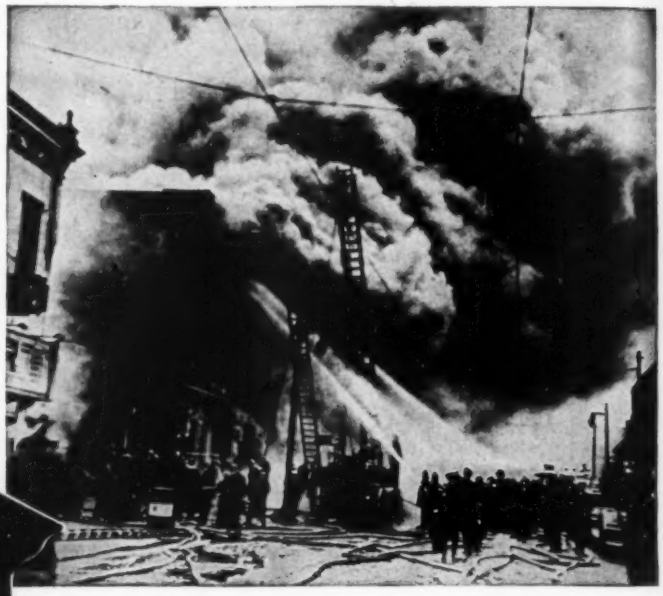

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FIRE ENGINEERING

AUGUST, 1947 VOL. 100, NO. 8

With the Editor

Hindsight—and Foresight

Of late, members of the fire service, singly and in association, have voiced their criticism of the increasing cost of fire apparatus. One large state association has passed a resolution asking that the International Association of Fire Chiefs conduct a "probe" pointing out that "it is costing the taxpayer considerable unnecessary expense for constant repairs to old apparatus that we have wanted to replace," and asking for standardization of fire truck chassis with pumps, ladders and the like "to be chosen by fire departments to suit their needs."

With many of the criticisms, including that of the taxpayer paying plenty in the effort to keep obsolete equipment operating, we have no quarrel. But in fairness to manufacturers who are not able to present their side of the case in the public press or elsewhere, we cannot resist offering a word or two in their defense.

There is one cardinal fact which those who offer their criticism may not realize. That is the simple truth that the fire apparatus industry itself is a victim of circumstances, no less than other manufacturing groups throughout the nation.

Those whose hindsight is sharp may remember that manufacturers of apparatus did everything possible during the recent war to get priority sufficiently high to procure the necessary materials—raw and finished—from which to manufacture their fire apparatus for municipalities which needed the equipment to protect war industries, etc. Not only were the needful components not forthcoming then, but they have not been procurable in any volume since. Precisely the same things that have caused shortages and rising prices in other fields have affected the apparatus manufacturers. Everyone knows what these are—the rising cost of labor, lessened work hours, the strikes and economic upheavals, just to name a few.

Let's look further into this price question: We have before us one manufacturer's price list, dated January 1, 1942, which was predicated on December 31, 1941, costs and was frozen by OPA on March 15, 1942. Remember, fire apparatus remained under OPA control until May 18, 1946! During that entire time this company's prices remained stationary, but labor and material costs were constantly on the upswing. This firm is still filling orders which were taken at firm prices while OPA controlled fire apparatus pricing—apparatus which is being produced at a decided loss at this time.

This firm's current price list shows an increase of about 45 per cent over its 1942 schedule, and since 1941, the pay rate for labor has increased 75.7 per cent and the cost of materials it uses has increased as follows: Aluminum, 10 per cent; steel sheets, 20 per cent; steel castings, 100 per cent; bronze castings, 100 per cent; lumber (Douglas Fir ladder stock), 100 per cent; automotive units (engines, axles, transmissions, etc.), 33⅓ per cent.

In view of these facts, a 45 per cent increase over 1942 prices is not only justified, but may be too low in view of the fact that orders being closed now may not be filled until 1949 and materials cannot be purchased for delivery that far ahead on a firm price basis. Who can predict what the cost of labor and materials will be two years hence, asks this company.

Comparison with manufacturers in other lines makes this firm's 45 per cent increase look still more modest. Automobile and truck (commercial) prices today, in some makes, show increases up to 75 per cent or more over 1942 prices. And other lines using the same basic materials as are employed to build fire apparatus will show 100 per cent or more over 1942 schedules.

Knowing this, and knowing the increased cost of everything else in the scheme of things today, it would appear there is little real justification for such complaints of rising prices.

Then consider deliveries: Statements made that delayed deliveries of apparatus are unwarranted are similarly unjustified, if our same hindsight is correct.

Deliveries of pumpers and aerial ladders before the war, when there was an oversupply of manpower and materials, were from four to six months. Deliveries today are averaging approximately eighteen months.

In 1939 about 70 per cent of American cities needed new motor fire apparatus and were placing orders with American manufacturers at a fairly high peacetime rate. In 1940, the U. S. Government entered the market and began placing orders for apparatus at hitherto unheard of quantities. In 1942 materials for such apparatus became very scarce and what materials were available had to be reserved for apparatus for the armed forces. Cities found it necessary to get priority certificates to buy fire apparatus; the certificates were about as scarce

as hen's teeth, and if they were had, deliveries were doubtful, as nearly all manufacturers were wrapped up by work for the armed forces. This situation continued, your own hindsight may remind you, until the collapse of Germany in 1945, after which priorities were no longer needed by cities to buy apparatus. Whereupon many unrated orders for apparatus in the files of apparatus manufacturers were then placed in production schedules. This came just about the time of a buying tidal wave for equipment which is still growing and which bids fair to be three or four times the normal peacetime rate.

Our records indicate some suppliers who serve apparatus manufacturers are themselves twelve months behind on deliveries. And so it goes—right down the line.

What's going to be the outcome? And here's where foresight comes into the picture. Well, in the opinion of those closest to the situation, if things continue as they've been going, it will take several years—not months, but years—to bring fire apparatus production in line with sales.

To fire chiefs, fire commissioners and others who bemoan the rising cost of fire fighting facilities, and of all government necessities, we have only this suggestion. Hindsight indicates that whenever there has been an appreciable upswing in the cost and price levels of fire apparatus, the returning pendulum of prices never swings back to its old level. Our forecast therefore is that apparatus prices are going to increase before they decline and deliveries are going to improve only gradually! Which forecast may be taken as 'foresight' by those forethoughtful officials who need apparatus at the earliest possible moment—and realize that while a city may wait for prices to tumble, fire won't wait.

Keeping 'em Rolling!

One of the most serious post-war problems of the fire service has been that of replacing war-worn apparatus and equipment. Even with apparatus manufacturers working at top speed, deliveries of new equipment is slow and scarcely able to keep abreast of the normal expansion of the nation's fire service, let alone provide necessary replacements for out-moded and decrepit apparatus.

This situation has focussed attention on the facilities, or lack of them, in the fire service for maintaining its fire control weapons, its rolling stock, and the tools of the trade at required efficiency. The picture we see, when we review the problem, is disturbing, to say the least.

The first thing that strikes us is that while the need for more and better maintenance and repair facilities has increased steadily since long before the war, the facilities themselves have not been forthcoming—both in number of skilled craftsmen and workers and in the mechanical equipment necessary to enable them to do an adequate job.

Manpower shortage in the ranks of fire fighters continues serious in many localities. But personnel shortage in the vital maintenance and repair end of the service is general and shows little signs of improving.

Contributing factors, of course, are the penuriously-minded politicos whose knowledge of the business of fire protection and prevention goes no further than the painted finish on a fire truck, and who can see no reason for engaging capable mechanics and other workers to provide at least a modicum of effective maintenance service for their communities' fire departments. If they do recognize the necessity of such persons, they too often refuse to pay the necessary salaries to get them and keep them.

Further, the conditions under which many municipalities attempt to carry on repair and maintenance work are deplorable. The "plant" or "shop" in which men must toil is all too often poorly suited to the work that must be done; the building itself is usually a discarded old fire house or some municipal cast-off structure that long since outlived its original purpose. Indeed, there are fire departments trying to operate maintenance and repair service in buildings which the department itself would condemn quickly, if occupied by any other tenant than the city! It would be all wrong for anybody else to labor under such conditions, but it is quite all right for the fire service to do so!

Even in many of the better plants and shops, lighting, heating, ventilating and sanitary conditions are below par as measured by the standards of any self-respecting, private industrial employer. And in nearly every case, the department's repair and maintenance division is poorly located for efficient operation—and the division of maintenance and repair is a sort of orphan child. There is little coordination between it and other divisions of the department.

It's about time that fire service maintenance and repair came into its own. It can be dignified, if it need not be glamorized. It is one of the vital entities of the modern fire department. Perhaps most important of all, it is one division that under the right conditions can be made to produce a satisfactory return on the investment made in it by the municipality.

To these statements we are certain enterprising apparatus and equipment manufacturers will subscribe. They would much rather the municipality would handle most, if not all of the bothersome and costly adjustments and other maintenance details which they are now being called upon to do, and at a time when their efforts should be concentrated on turning out complete units for replacement and expansion of the fire service.

Those readers who subscribe to this belief may find some encouragement in the article on how the New York Fire Department keeps 'em rolling in this issue of FIRE ENGINEERING.

Fred Shepperd

Historic New York Fires Have Influenced Fire Service

Nation's Fire Protection and Fire Prevention Policies and Procedures Have Been Materially Affected by What Has Happened in the World's Largest City—and Its Great Fire Department

By ROI B. WOOLLEY

Editor's Note: **The 74th Annual Convention of the International Association of Fire Chiefs, held as it will be in the world's largest city, will naturally focus attention on that city's fire force, and its history and exploits down the years.**

As a companion article to others concerning the New York Fire Department published elsewhere in this issue of "Fire Engineering," the editors are pleased to include this brief account of the more outstanding fires and conflagrations fought by the department, from its earliest days, with emphasis on those occurring since 1865, which date marked the inauguration of the metropolitan paid department.

Let it be said at the outset, these all-too-brief accounts do not even attempt to cover all the important battles waged by New York City's fire-fighting forces. It would take many volumes to tell that entire story. In the limited space available, the editors have endeavored to discuss those particular fires which were outstanding, particularly from the point of their interest to the nation's fire service, and their subsequent influence on its fire protection and fire prevention programs and procedures.

The editors gratefully acknowledge the welcome assistance of officers and members of the New York Fire Department, the Fire Bell Club of New York, and of its many enthusiastic editorial contributors in providing material for this symposium, and in helping check New York Fire Department archives against the data taken from 70-year records of this publication.

* * *

NEW YORK'S first general conflagration occurred on September 21, 1776, a week after the British had occupied the city, then a place of 20,000. It started in the Fighting Cock, a tavern, about 2:00 A.M., and quickly spread on the wings of a southwest gale.

The four ancient fire engines, left behind by the firemen who fled the city when the British took over, were dragged out but failed to function. The red coats cried 'sabotage' when even the leather buckets were found cut and useless.

New Yorkers in General Washington's lines watched the smoke of the conflagration at the other end of Manhattan as the fire wiped out a quarter of the city—one-eighth of its buildings, 493 in all, with a loss of $10,000,000 in the several days' blaze.

In 1778 another disastrous fire swept two entire city blocks near Coenties slip. This consumed sixty-four dwelling houses, six stores and two small ships.

Then, on December 9, 1796, the fire department, "reorganized shortly before," faced the third great city conflagration. It wasn't to be compared with the fire of 1776 but it was costly. It started about 1:00 A.M. on Murray's Wharf, spread rapidly to Maiden Lane and before it was controlled it had burned nearly seventy buildings and cost the department the apparatus of Union Engine 18, which was cut off and had to be rolled into the river. The fire was stopped by tearing down the fish market, in its path.

The fourth great fire came on December 18, 1804. It broke out in a grocery on Front Street and raged for several hours, wiping out many fine old revolutionary landmarks. Forty buildings, valued at $2,000,000, were destroyed. There were whispers of arson in connection with this fire.

On May 19, 1811, a quiet Sunday, fire started in a coach factory near Duane Street. It spread, aided by shingle roofs, in defiance of the feeble efforts of the firemen, sparks igniting church steeples and other structures. In two and a half hours, 102 houses and forty-three business places were destroyed at some distance from the main conflagration. Losses in this fire were very heavy.

The same month, on May 18, 1828, fire destroyed the Bowery Theatre in Bayard Street, two livery stables and a tavern. One fireman was killed by a falling cornice. This fire made fire department history in two ways: (1) As far as is known this was the first time a New York City fire engine was ever drawn to a fire by horses; (2) It was the first time help was asked from another city. Brooklyn send aid across the river—and Yorkville Engine 45 harnessed up three horses and rushed its apparatus down from 84th Street. It was not until November 8, 1832, that the first horses were added to the fire department.

A series of serious fires between the cholera epidemic and the great conflagration of 1835 was topped by a raging blaze April 30, 1833, when seventy houses of the foreign colony in Greenwich Village were wiped out in twenty minutes, over 150 families being made homeless.

These fires were preludes to the worst conflagration in New York's history, the "Great Fire of 1835." The city then had a quarter of a million people, with 35,000 homes. There were 1,500 men in the fire department. But on the fortnight before the fire, the organization was worn out; every engine in the city had turned out December 14th to combat two bad fires in the downtown area. Streets were deep in snow. It was below zero.

A member of the City Watch discovered the fire on the night of Decem-

Courtesy of The General Detroit Corp. from a print from the Bettmann Archive

Burning of Barnum's Museum, July 13, 1865

ber 16 in a five-story warehouse on Merchant Street. Before water could be gotten on the fire the building was ablaze and the near-gale had whipped flames across Exchange Place and down to Hanover Square. Soon the finest buildings in the city were ablaze, almost before the tired firemen could get into action. Wells and cisterns were frozen solid and engines were sent to the East River to pump water, but that was frozen over too. Holes were cut in the ice for pumps which were run onto the frozen surface. Water froze in the leather hose but some engines were got going "when alcohol was poured into the pumps."

The fire raged despite help from the military and civilians. The northern part of the city was said to have been saved by a single stream directed by Zophar Mills. Many firemen turned their hand to salvage, when fire fighting seemed fruitless.

Brooklyn sent companies across the icy river by ferry. A locomotive was rushed from Jersey City to Newark with a plea for aid and returned one hour later, pulling a train of flat cars full of engines of the New Jersey metropolis. Volunteer helpers poured in from as far away as White Plains, N. Y., and Morristown, N. J. The Franklin Fire Company came all the way from Philadelphia.

Morning found the fire unchecked—and it progressed for days. In Brooklyn, boats and naval installations caught fire, causing more confusion. On December 18, after the fire had been burning two days, 400 more Philadelphia firemen came to help.

Gunpowder was finally employed to clear away buildings and thus stop the advance of the flames. Sailors from the Navy Yard did the work. It is said the fire destroyed $26,000,000 worth of property, 500 stores and exactly 674 buildings. The conflagration stirred up a hornet's nest of politics, and Fire Chief Gulick, then in charge, was attacked by Tammany.

On October 5, 1839, a fire on Water Street called out all apparatus and did nearly $1,000,000 worth of damage. This followed a serious fire of September 23rd, of that year. The Water Street blaze repeated, on a smaller scale, the devastation of the 1835 fire and lasted from midnight to 8:00 A.M., being stopped only by the East River. Fire department politics were proving costly in the reduction of efficiency and there was much criticism of fire fighters.

Soon after the city gots its first Croton water, the New York Tribune Building burned (Feb. 4, 1845), many employes narrowly escaping death.

On July 19, 1845, the city experienced its worst disaster to date in point of loss of life. The fire started about 3:00 A.M. in a sperm oil store on New Street and spread rapidly across Exchange Place to Broad Street, reaching the big storehouse of Crosker & Warren which was loaded with saltpeter. An **explosion ensued after the warehouse** had been burning for about ten minutes, which rocked the area, breaking windows all the way up Canal Street. The warehouse vanished, killing more than thirty persons, four of them firemen. One lucky fireman rode the soaring roof of the blasted structure to the top of another building across Broad Street.

The blast destroyed three other buildings and started new fires. Calls for help were sent by Chief Engineer Anderson, and Brooklyn, Williamsbridge and Newark sent engines, three from the latter place. Twelve hours later the fire was reported under control. By then, 300 buildings worth $10,000,000 had been destroyed.

In 1848, on September 9, at 11:30 A.M., Brooklyn suffered its first great fire and twenty New York engines were ferried over to help. This fire raged all night and was finally checked by the use of gunpowder, with a loss of $1,500,000.

On February 5, 1850, the department, "rotten with inter-departmental rivalries, inadequately equipped and partially disorganized," operated at the Hague Street explosion. Two buildings at 5-7 Hague Street were blasted to bits at 8:20 A.M., when a 200 hp. boiler exploded. Fire followed, and sixty persons were killed and over seventy injured.

Five months later, during a fire in a warehouse along Furrman Street, a storage of saltpeter exploded blowing a fire engine into the river. No one was killed but the loss was $400,000.

On November 20, 1851, as a result of a false alarm and panic in a public school on Greenwich Avenue in the Village, over forty children suffocated.

During the period 1851-1863, the fire department, which had become better organized, fought several serious fires. One was the Harper Bros. Publishing House conflagration on December 10, 1853. It started at 1:00 P.M., caused by an exploding lamp, and sped by high winds, the flames leaped Read Street. Many girl employes of the firm were rescued. The Harper warehouse was destroyed with loss of $800,000 within an hour. Included in the destruction was the 100-year-old Walton House with its priceless relics. Every fire company in the city went to work. Horses drew apparatus down from Harlem and Yorkville and four Brooklyn engines (1, 4, 5 and 7) were hurried over. Croton water helped firemen finally control this blaze but sixteen big buildings were destroyed and many others damaged. There was no dynamiting.

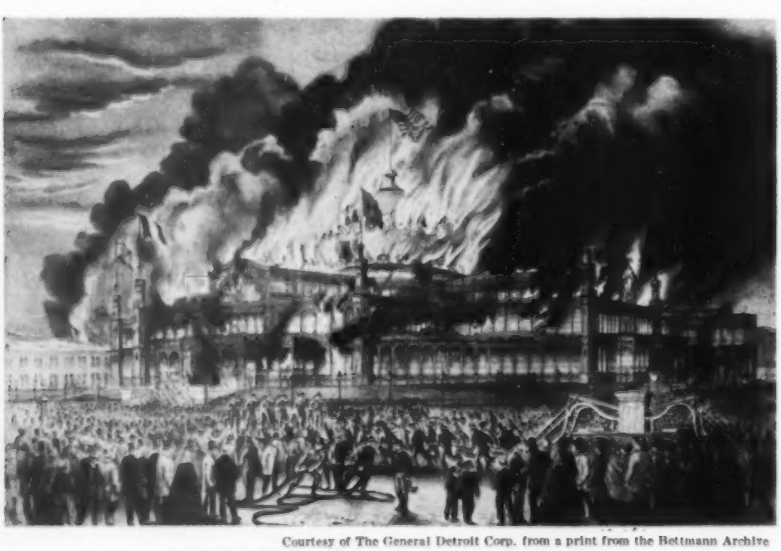
Bowery Explosion Kills Six

While fighting a fire at 53 Bowery, June 18, 1868, Engine 9, the Fire Department's first Amoskeag steamer, exploded, resulting in death of six and serious injuries to twelve others.

The Jennings fire, on April 25, 1854, although much smaller was a major disaster for the fire department. It began at 8:00 P. M., and while the department was fighting the flames in the American Hotel the wall of a 4-story building occupied as a clothing store by Wm. T. Jennings & Co. at 231 Broadway, opposite the City Hall fell, trapping nearly forty firemen. Twenty were saved alive from the wreckage, but thirteen were recovered dead.

On August 18, 1858, a fire attributed to fireworks, discharged from the roof of the City Hall the previous evening during the celebration of the laying of the Atlantic Cable, damaged roof, dome and cupola of the historic structure.

On October 5, that year, came the spectacular Crystal Palace fire. The world famous structure, scene of the Great World's Fair of July 1853, which covered an entire block on 42nd Street contained 1250 tons of iron and 39,000 square feet of glass. The alarm came with 2000 spectators viewing the valuable exhibits, including fire apparatus.



Courtesy of The General Detroit Corp. from a print from the Bettmann Archive

Burning of Crystal Palace, New York, October 5, 1858

They barely had time to stampede to safety through the Sixth Avenue doors before flames enveloped the vast structure.

The fire department was helpless and unable to save two fire engines, two hose carriages and a ladder truck which were on display there. They did manage to drag out two other hose wagons, however, before the walls collapsed. Twelve minutes after discovery of the fire the dome and roof fell in.

On February 2, 1860, came one of the first of the disastrous tenement fires that have plagued the great metropolis. This was the destruction of a six-story building on Elm Street, in which twenty perished. There were no fire escapes and stairways were combustible. Then, on the eve of the Civil War, the City passed a building and fireproofing ordinance which stipulated, among other things, dwelling houses for residence of more than eight families shall have "fireproof stairs" or fire balconies on each story outside, connected by fireproof stairs. If the buildings were not built with either the stairs or balconies . . . specified, then they must be "fireproof throughout."

The fire department played an important part in the Civil War, its members, including the famous Ellsworth Zouaves, writing stirring chapters of heroism in the military forces of the northern forces. At home the volunteers also underwent "a fearful test" particularly, in the draft riots and fires of 1863, when scores of buildings were burned by terrorists. Firemen fought furious mobs, and raging fires, racing from one blaze to another, in one of which Chief Engineer Decker was nearly lynched. The Orphan Asylum, Tribune Building and many other places were fired. Troops were called out to help suppress the rioters and aid the firemen. Brooklyn, too, had its baptism of terror. During this period losses by fire ran into the millions, and over 1,200 persons were reported killed.

This was the dramatic finale of the old volunteer organization. The professional took over after a stiff political battle in 1865, the new force consisting of 585 men. On June 22 of that year the Court of Appeals ruled finally in favor of the new department with Chief Decker as Chief Engineer. His first serious blaze following this action was the fire in Barnum's Museum at Broadway and Ann Street on July 13, 1865.

Elisha Kingsland were elected first Chief Engineer of the professional paid department on August 1, 1865, which then had 39 engine and 15 ladder companies but there remained much agitation against the paid forces, particularly following two large fires—the destruction of Academy of Music, May 21, 1866, in which two firemen were killed when an explosion destroyed Engine 16, and the burning of the Chittenden Building on Broadway, the following year.

The paid department, however, was definitely a fixture, and it continued to grow with the city. Fires, too, increased in number and although conflagrations such as those which wiped out whole blocks in years past were now of rare occurrence, nevertheless the department had to face increasing hazards as time passed and conditions changed.

Manifestly it is impossible to recount all these subsequent serious fires. At best we can only hope to touch on the more important—those which for one reason or another had national as well as local significance. Many such as the more recent tragic hotel fires, and the serious wharf and ship fires have been omitted from the following account, because they have already been described in detail in FIRE ENGINEERING.

Brooklyn Theatre Fire

On Battle Hill, in Greenwood Cemetery, Brooklyn, stands a granite monument, bearing this inscription:

"Erected by the City of Brooklyn to the memory of those who perished in the Brooklyn Theatre Fire. The fire was discovered shortly after eleven o'clock P.M. 1,000 persons were present, of whom 278 were burned to death. The remains of 103 were buried in this plot, December 9, 1876. The theatre, situated on the southeast corner of Johnson and Washington Streets, was burned **on Tuesday night, December 5, 1876."**

In 1869, Brooklyn's Fire Department had 2,366 members, eighteen steam engines, five hand engines, ten hose carriages and three hook and ladder trucks.

The Brooklyn Theatre, constructed in 1871, measured 70 x 121 feet. It was then the "last word" in appointments and safety. Capable of seating 1600, it could be emptied in six minutes. Construction was concrete, stone and brick. Gas jets were enclosed by wire globes. Smoking was prohibited. The building was not fireproof but it was supplied with doors, stairs, windows and lobbies and the exits, instead of concentrating to one or two points, diverged at easy angles and tapped three streets. There was an orchestra (then called parquet) second and third balcony, called dress circle and family circle. On the night of the fire, 250 tickets had been sold for parquet and balcony, 300 for the dress circle and 409 for the family circle.

The fire originated on stage, when a

Photo from Fire Bell Club Museum

Dramatic Rescues at Epochal Windsor Hotel Fire

At St. Patrick's Day fire, 1899, which cost forty-five lives, New York firemen established record for heroic rescues. Shown are life saving operations on Fifth Avenue side of building, with aerial, pompier and straight ladders in use.

piece of canvas border scenery was ignited by a border light near the center of the stage. A carpenter tried to remove the smouldering canvas but it burst into flame and spread to adjoining flammable material.

Actors on stage at the time—it was the last act of "The Two Orphans," aware of an incipient fire overhead, at first proceeded with their parts in an effort to allay fears. But when woodwork ignited and burning fragments fell to the stage floor, the audience began to take alarm. The fire was fanned when an unidentified person opened the scenery doors on Johnson Street. The northwest wind entering through this opening carried flames along the top of the house. Another individual mistakingly turned off the gas lights, plunging the place in darkness, except for the flame of the fire. The drop curtain was lowered, but was consumed by fire in seconds.

Panic and confusion caused most of the loss of life. The audience in the orchestra managed for the most part to escape. The heaviest fatalities occurred among those in the balconies who jammed the one flight of stairs from the upper balcony and stair platforms from which exits led into Washington Street.

The tragedy resulted in widespread agitation for better theatre protection against fire, including truly fireproof curtains, more and wider exits, safer lighting, inclusion of emergency fire fighting equipment and use of less flammable construction material.

The Windsor Hotel Fire

New York City has known many hotel fires—and many tragic ones, but the destruction of the Windsor Hotel on St. Patrick's Day, March 17, 1899, with a death toll of forty-five, set a record for death that has thus far not been equalled in that city.

The Windsor Hotel was seven stories in height and occupied the east side of Fifth Avenue between 46th and 47th Streets on a plot 250 x 150 feet.

It was of brick exterior and wood interior. Two private houses on 46th Street served as Turkish baths and were directly connected to the hotel on two floors. A large front entrance faced Fifth Avenue, and a wide, curved marble stairs led to the next floor at the north and south ends of the hotel. There were side entrances on 46th and 47th streets and a servants' entrance at the rear. Open grilled elevators were located on the Fifth Avenue side near the front entrance. On each floor, wide public halls skirted the boundaries of the Hotel and were interconnected. Courtyards were located in the north and south wings, giving light and air to inside rooms. A large court was also located in the rear.

It is said that rope ladder fire escapes were located in every room of the hostelry and that these, with fire escapes, had been placed on the rear and sides of the building following the tragic Hotel Royal fire of 1893. Four standpipes were later installed.

The Windsor was more a resident than a transient hotel. It was a sedate hospice, occupied on that fatal St. Patrick's Day by a select crowd, most of them watching the merrymakers on the street, kept in line by policemen, waiting for the traditional parade. At the time of the fire it is said there were 275 persons registered at the Windsor but because of the parade the building contained many more than that number.

Accounts differ as to the cause of the fire, and the reported delay in transmitting the first alarm. Press accounts attributed the start to a thoughtless guest whose flipped match ignited curtains of a room on the second floor, and told of a waiter's futile effort to extinguish the fire. The fire was discovered almost simultaneously by thousands of startled spectators, who saw smoke issuing from a second floor parlor window on Fifth Avenue near 46th Street.

The first alarm was received by the Bureau of Fire Alarm Telegraph at 3:14½ P.M. from box 523 at 45th Street and Fifth Avenue. Almost immediately, three other boxes were pulled. In less than five minutes, a third alarm was transmitted, followed by a call for three public ambulances. A fourth alarm was registered at 3:28 P.M. and a fifth alarm at 3:38 P.M. Considering the fact that the apparatus was all horse drawn and had to negotiate the crowds, the department's response was unusually prompt.

Box 523 brought Engines 65 (first due, from its location midway between Fifth and Sixth Avenues on 43rd Street) 54 and 21 and ladders 2 and 4 all under command of Battalion Chief John Binns (9th Batt.). As Engine 65 arrived, the bodies of nine women who had jumped from various heights lay on the sidewalk of the 47th street side. The fire at this time was on the 46th Street side and smoke was being carried toward Madison Avenue, eastward.

Hampered by the milling crowds, first alarm companies stretched lines and tried vainly to confine the fire. Men and women overtaxed the fire escapes. Others, trapped by the rapidly spreading flames through the long high-ceilinged hallways, sought the windows. No person jumped after the arrival of the firemen, whose rescues on that day wrote a magnificent chapter in the annals of the department. Rescues were made by scaling ladders, some operated from the tips of extension ladders fully extended. All sorts of portable ladders were also used. Some persons, impatient to be saved, resorted to the rope ladders provided by the hotel but in their haste and panic slid the ropes, unchecked, to crash to the sidewalks. Others, too overcome by smoke, were unable to use these makeshift safety measures. But as rapidly as persons appeared at windows, firemen labored frenziedly to save them and managed to do so in nearly every case.

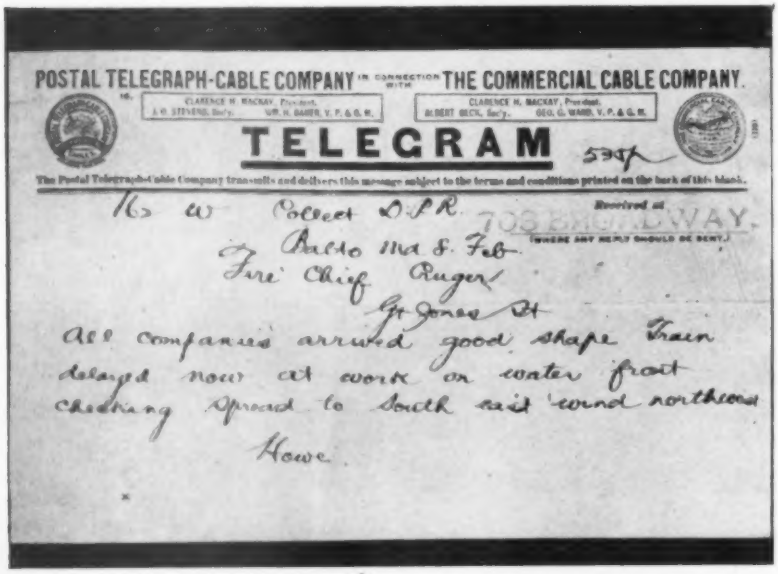
Additional alarms brought to the fire Chief of Department Hugh Bonner; Deputy Chief Charles D. Purroy and Battalion Chiefs Welsh, Byrne, Duane and Castles, as well as Acting Chief Farley. After the fifth alarm there were twenty-four engines and six ladder trucks at the scene.

Within twenty minutes after the first alarm, the center section of the Fifth Avenue front wall crumpled and fell. A heavy water tank on the roof, falling, cut the upper part of the structure in half. This proved somewhat of a blessing as it provided a flue which reduced the heat in that part of the building. Ten minutes later the side walls on 46th and 47th Street fell. Up to the very last, as long as there was a sign of a victim in the structure, fire fighters labored to remove them.

A drug store on the southwest corner of 47th Street was soon filled with dead and dying. Many neighbors, including Miss Helen Gould, opened their homes to receive the injured. The Gould home, turned into a hospital, was protected from radiated heat by heavy fire streams.

Many a fireman received a well-earned decoration for his heroic work on that afternoon. Many others, whose services were equally heroic perhaps, did not. In the confusion and the stress of the struggle, many intrepid rescues went almost unnoticed.

Perhaps the real tragedy was that the catastrophe, which should have served as a lesson to the nation's hotel industry, produced little in the way of tangible nationwide reforms in fire protection and prevention for such occupan-



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Telegram from Baltimore Announcing the Arrival of New York Firemen

cies. Like the Hotel Royal fire, it did have some beneficial effects, locally. But many other disastrous hotel fires were to follow that need never have occurred had the lessons of the Windsor been taken to heart.

Longest Still Alarm on Record

Any account of the outstanding operations of the New York Fire Department would be incomplete if it omitted the "longest still alarm on record"—the response of New York units to aid in fighting the great Baltimore conflagration.

At 2:30 A.M. February 8, 1904, house watchmen in Engine Companies 5, 7, 12, 13, 16, 26, 27, 31 and 33 and Ladder Company 5 (all with the exception of Engine 7 double companies) received telephone instructions from fire alarm headquarters to "proceed to the Liberty Street Ferry forthwith!" (that "forthwith" has been a widely used word in N. Y. F. D. vernacular!). Engineers were instructed not to start fires in their steamers and most of the units were given only vague, or completely misleading information on what was happening or where they were going. Many were led to believe they were going to fight a fire in Jersey, or to stand fast on the water front to prevent extension of a fire to the Manhattan shore.

What actually had happened was that they were about to embark to aid in fighting the devastating Baltimore conflagration, raging through the city's business section since shortly before 11:00 A.M. on the day previous—February 7. Calls for outside aid went out from Baltimore forty minutes after its entire fire department was thrown into action against the raging blaze. The fire departments of Washington, Wilmington and Philadelphia sent a total of thirteen companies in response to these early pleas for assistance. In New York, Acting Chief of Department Charles W. Kruger (pending outcome of the appeal of Chief Edward F. Croker for reinstatement as Chief of Department), on receipt of several unofficial calls for help, made arrangements for possible dispatch of forces should the official call be received. This was forthcoming and at 2:00 A.M. Mayor George B. McClellan of New York received this message from Mayor McLain of Baltimore: "If you can send fire engines to us with double crews of men you will help us. The Baltimore and Ohio R. R. is ready to take them."

Mayor McClelland's advice to Chief Kruger was acted upon at once and the companies were ordered to report to the Pennsylvania R. R. terminal in Jersey City. In the meantime, the Central R. R. of New Jersey telephoned that it had a train ready for the trip and Chief Kruger ordered companies to use that road instead of the Pennsylvania. However, Engine Companies 26 and 33 and Ladder Company 5 failed to receive this second command, and traveled by the "Penn" arriving in Baltimore two and one-half hours ahead of the other contingent.

Leaving quarters, most of the men hadn't the faintest idea they were bound for a city 185 miles distant—didn't even know there was a big fire in Baltimore (there were no radio newscasts in those days and morning papers featuring the fire were not yet off the press).

Triangle Shirtwaist Tragedy Never Duplicated

Lessons learned in tragic Triangle fire of March 25, 1911, in which 147 perished have helped prevent repetition of that fatal "sweatshop" blaze. Illustration shows victims who plunged to death in front of 10-story building despite department's desperate efforts to save them with life nets.

The first engine reported at the foot of Liberty Street with fire burning and steam up. Firemen on the tender following had hose unreeled and connected to a hydrant at the curb. Other company officers had been told by the telegraph dispatcher that the "City of Baltimore" was on fire, but the men misinterpreted the message—believing it referred to the "City of Baltimore" *ferryboat* that tied up in the Liberty Street slip. Members of Engine 33 seem to be the only crew who were fully aware of where they were going, and that was because Chief Kruger used their Great Jones Street station as his headquarters and the lengthy and serious early morning telephone discussions served as a tip-off. They of all the personnel came prepared with money and an extra change of clothes.

Battalion Chief John P. Howe was in command of the men. Dr. Harry Archer, then as now a friend of firemen, was invited along as a guest. Another traveler was Honorary Deputy Chief William Conran.

It took three hours to load engines and tenders on flat-cars in Jersey City. The thirty-four horses were quartered in two stock cars. At 6:25 Monday morning, with the men settled in two passenger coaches, the "Fire Flyer" pulled out of the terminal. At Philadelphia each man got a cup of coffee and a roll—hardly satisfying fare for hearty appetites. An additional locomotive was coupled in Philadelphia for greater speed, but the axles couldn't stand it, and hot boxes developed, to delay the party until they cooled off. The flat-car carrying Engine 13 ran off a switch, causing further delay. It took four hours to run from the Quaker City to Baltimore, then, normally a two hour ride.

At 1:15 P.M. Monday the New Yorkers arrived to reinforce exhausted Baltimore firemen at a period when the advancing conflagration had burned unchecked to Jones' Falls, which divided the business district from the city's factory and tenement district. Here they joined forces with other aiding units, to prevent the flames from crossing the stream. The fire already had possession of large coal pockets near the docks and a lumber yard. Other lumber yards, large grain elevators and steamship wharves were vital exposures. It was a critical situation.

With their steamers drawing water from Jones' Falls (it had early been found that owing to the difference in hydrant and hose threads between New York and Baltimore the aiding forces could not use the latter's water supply system), good streams were developed and used to protect coal and lumber piles. On Monday, Dr. Archer spent most of the $106 which he had grabbed before leaving, for food for the hungry men. There was no "disaster plans" in those days. By Tuesday noon it was apparent that their work had succeeded in helping stave off destruction in that area and they were released to return home, tired, dirty—and still hungry.

Fortunately none of the New Yorkers were injured, although Mark Kelley Fireman, attached to Engine 16, contracted pneumonia from exposure while working at the fire and died seventeen days later.

Triangle Waist Tragedy

To quote the New York Fire Department ("W.N.Y.F."), "It is doubtful whether any catastrophe in the experience of the New York Fire Department has produced the sheer horror, the shocking sacrifice of life, the enraged public indignation and the beneficial reforms occasioned by the Triangle Shirt Waist Fire of March 25, 1911."

The fire took the lives of 147 victims, most of them young girls, who either crashed to death in panic-stricken leaps from ledges 100 feet above ground or were burned to death by the fire within the upper floors of the 10-story Asch Building, or on its fire escape.

The building, at 23 Washington Place, was considered a "safe" loft building. It was of fire-resistive construction, had a 4-in. standpipe with 50 ft. of hose connected on each stairway landing, with outside siamese connection for the fire department. Fire pails were distributed on each floor. An automatic alarm system protected the entire building. The northeast and southwest corners of the building were each occupied by two elevators and a stairway. On the rear of the structure was an iron fire escape passing directly in front of windows, fitted with almost vertical ladders and terminating ten feet above a court with no exit to the street.

The three top floors were occupied by the Triangle Waist Company which manufactured shirt waists under deplor-

able sweatshop conditions. On the 8th and 9th floors a total of 575 women operators toiled at continuous rows of tables, each containing a double row of sewing machines and piles of flimsy cottons and shirtwaists in process of manufacture. At the south end the tables reached so closely to the wall that for the girls to get to the exits they had to walk the entire length of the crowded space between the tables and then make their way among the boxes and small tables that blocked the single aisle. Normally, operators were forced to use the northeast exit and were made to approach it through a narrow alleyway formed by a partition, so that their purses and persons could be examined for stolen goods. Most of the workers knew of no other exit. The proprietors had ignored suggestions that fire drills be conducted frequently. On the 10th floor, sixty additional persons worked in stock and shipping rooms, where also finished garments were pressed with gas irons.

Instead of being closed that fatal Saturday afternoon, as normally would be the case, the rush season was on and overtime was the order of the day.

At 4:45 P.M. the "power off" bell rang. Girls started making their way between the rows of tables towards the cloak room but the majority were still seated at their machines. On the 8th floor, where 225 employes were preparing to depart, a girl reported to the superintendent that "the boys were putting out a fire on the Greene Street side." He seized two fire pails and went to help, but the fire was in a rag bin and spread rapidly, involving the cutters' tables and layers of flammable muslins and tissue paper lying there. A man tried to use the standpipe hose but he couldn't turn the valve—and the hose was rotten. Instantly, the fire was out of control.

Most of the 225 employes on the 8th floor eventualy escaped with their lives. Fifty cutters reached Greene Street by the stairway at the first cry of fire. But the mass of girls found their passageway to the exit blocked by flames. Some knowing the Washington Street exit, charged for it. Impatient at waiting for the elevator they tried the door leading to the stairway. It was locked. Even when the lock was forced, it jammed with the weight of frenzied girls, as it opened inwardly. When one girl fainted in the narrow winding stairway, others piled up—many were left in the room with fire blazing around them.

A few of the desperate victims climbed to window ledges, hesitated until their hair caught fire, then jumped to death. About twenty others, less excited, ran for the rear fire escape. Most of them managed to reach the sixth floor where they re-entered the building and were saved.

At the start of the fire the bookkeeper warned the staff of sixty employes on the tenth floor to run. The freight elevator made several trips to this floor, removing many. Some ascended to the roof, where they were removed via ladders to the New York University Law School but several girls, left behind, ignorant of an escape passage, jumped to their deaths.

Fire meanwhile quickly reached the 9th floor, by lapping out of windows, where it quickly spread over the entire area. Open doors at floor and roof landings of the Greene Street stairway formed perfect flues. Three minutes after the start of the fire the three stories were completely involved.

From the first sign of fire at the 9th floor, the 350 trapped workers had little opportunity to escape. More than 100 fought through the 20-inch passageway leading to the Greene Street stairway to safety before the roaring flames cut it off. Almost 200 others rushed about fruitlessly seeking an exit. Blocked at the Greene Street side, the mob surged across the Washington side. Elevators passed them loaded. The stairway door was locked—it was never opened. A very few picked off by the tiny elevators (measuring five by six feet) which returned but, regrettably, instead of discharging passengers a few floors below the fire and hastening the round trips, were driven by the operators clear to the bottom floor, and precious moments were lost. Many girls, despairing of reaching safety by the elevators, slid down the cables. At least two were saved this way but some met death, as did others who jumped down the shafts. When the fire was extinguished, nineteen bodies were found in a single elevator shaft on the Greene Street side.

Tongues of flame belching out of the 8th floor cut off the fire escape, warping the iron shutters on a building twenty feet across the court. Nevertheless, about a dozen persons from the 9th floor took this gamble. Only one got through and she was dragged into the 6th floor half dead. The choice was cremation within the blazing structure or getting onto the sills outside. From here scores toppled to their doom, some plunging through the sidewalk deadlights to the basement below, where their burning clothing started fires.

The fire department received the first alarm from Box 289. Apparatus arriving had to proceed cautiously to avoid crushing bodies of those who had already jumped. When Battalion Chief Edward J. Worth arrived on the scene, Engines 72 and 33 were stretching lines up stairways. He immediately sent second and third alarms. Later Deputy Chief John Binns transmitted the fourth alarm bringing Chief of Department Edward F. Croker.

Chief Worth ordered high pressure lines to cool down the upper stories and give a ray of hope to those still alive there. Ladder 20's aerial extension ladder could reach only the 6th floor and before scaling ladders could be put into action the damage was done. Civilians aided firemen of Engine 18 in stretching and holding their rope life nets. Three girls jumped into it from the 9th floor and net holders toppled onto the bodies of the victims. Meanwhile other nets were pressed into use, but falling bodies tore through them. It is said forty-one persons plunged to the street in quick succession from the windows above.

Firemen found over fifty bodies piled five deep in the cloak room of the 9th floor. The remains of twenty more girls were found between the long work tables.

Following the fire public indignation was aroused. While some bodies awaited identification, people were loudly demanding reforms. Chief Croker, who only a month before, while suggesting revision of the building and factory laws, had predicted this slaughter with alarming accuracy, urged the creation of a fire prevention bureau in the fire department.

As a direct result of the public outcry for legislation reform, the Factory Investigation Commission headed by Alfred E. Smith and Senator Robert F. Wagner drew up the Labor Law which became effective October 1, 1913. Fire prevention was established as a Bureau of the Fire Department on May 1, 1913. Under its jurisdiction was placed those sections of the Labor Law which aimed at the elimination of fire hazards in the city, providing adequate exits, fire resisting stairways, automatic sprinklers, limitation of the number of employes, fire escapes, alarm systems and fire drills.

Real estate and building interests have estimated the ultimate cost of the Triangle tragedy at over one billion dollars. It was money wisely spent because there has been no similar tragedy in the city since. Incidentally, the proprietors were punished for laxity, and one for locking a factory door during working hours. The cause of the fire was never fully determined.

Equitable Building Fire

February 9, 1912, marked the destruction of the Equitable Building, with loss of six lives and property worth millions. The fire threatened Manhattan's entire financial district—not to speak of the billions of dollars of securities in the Equitable vaults.

The fire is notable in fire department annals because of the revolutionary reforms in standpipe, sprinkler and general building code laws which ensued.

The Equitable Building was a composite of five structures erected at different times. It occupied an entire block bounded by Broadway, Nassau, Cedar and Pine Streets. It was called "fireproof" in construction, with flooring of wood on brick or hollow tile arches supported by wrought iron and steel "I" beams. At its highest point it was ten stories; the premises covered 48,000 feet. Openings through the dividing walls converted the entire set-up into a single fire area.

Two four-inch standpipes were installed, located one on each side of the building near the main elevators. They were supplied by two tanks of 2,250 gallons each; a siamese connection on the street was available to the fire department. Occupied mainly by bankers and brokers, it was a sturdy looking structure typical of its era. However, it was weak at its heart; it had unprotected columns and there were one large elevator shaft containing two cars and eleven small dumbwaiter shafts serving the Lawyer's Club and the Cafe Savarin from one kitchen on the 8th floor. The large shaft had openings onto each story except the 4th. Below street level were the huge vaults of the Mercantile Trust Company.

The morning of the fire was cold, the thermometer falling, with strong winds. At about 5:18 A.M. an employe discovered fire in the timekeeper's office, a frame 4 x 13 ft. cubicle, which involved a wastepaper basket, chair and part of a desk. While the employe, ignorant of what to do, ran through the labyrinth of corridors, the fire traveled from the tiny office to the large shaft and the dumbwaiter serving the club and cafe from whence it reached the upper stories. The elaborate old furnisihngs of the club rooms and cafe furnished ready fuel for the fire. Within about thirty minutes after its discovery the fire had spread over most of the build-

ing above the 4th floor and was eating its way downward.

Ineffectual and confused efforts of employes to fight the fire with a standpipe line lost valuable time. A policeman, called by a cafe employe, investigated, and called to another policeman who sounded box 24, corner of Nassau and Pine Streets. This was clocked at 5:34 A.M. and brought Engines 6, 4, 7 and two Ladder companies, with Acting Deputy Chief Devanny and Battalion Chiefs W. J. Walsh and George Kuss.

Engine 6, first to arrive, took a line to the basement down the winding stairway leading from the sidewalk. The fire in the timekeeper's cubicle was quickly controlled. Firemen, not knowing the degree of extension, proceeded to investigate and it was some time before the extent of the fire's headway and the need for additional help was determined. At 5:55 A.M. Chief Devanny sounded the second alarm.

Eight companies entered the building, and operated streams on the 2nd to and including the 5th floors for periods of from 15 minutes to one hour. But the fire, now under full headway, defied control. Little effort was made up to this time to operate street streams, owing to the narrow streets, and the wind, which the Weather Bureau records as having reached 65 miles per hour. The temperature gradually fell reaching 15 above zero.

It was soon apparent to Chief John Kenlon, who took command on the second alarm, that the situation was critical. Exposed to the fire were buildings ranging in height from five to twenty-one stories, most of which, although of 'fireproof' construction, had unprotected glass openings. The Fourth National Bank at 16-24 Nassau Street, of five stories, was of even more venerable construction than the Equitable Building. Companies stretched lines from standpipes to cover these exposures, and to use buildings as vantage points from which to hit the fire in the Equitable. In this respect the narrowness of Pine and Nassau Streets proved a decided advantage.

After transmission of the fifth alarm, at 6:28 P.M., Chief Kenlon had 23 Engine Companies, 6 Ladder Companies two water towers and 275 men in the battle. Soon after this, upon report of the extent of the heat within the structure, and knowing of the questionable interior construction, Chief Kenlon ordered all hands to back out of the building. There were then about ten companies operating in the interior and their removal, weakening the fire forces until they could take up their new positions, brought the most critical moment of the struggle. To help cover this retreat, Chief Kenlon deployed the fifth alarm companies, as they came in, to cover serious exposures and where possible protect the retirement.

Reinforced by the powerful tower streams, heavy streams from the surrounding buildings helped confine the flaming fire to the Equitable interior, but granite continued to explode from the heat, endangering firemen on the streets.

Just when it was believed all persons, firemen, and workmen were out it developed that three waiters of the Cafe Savarin had been cut off and trapped on the Equitable roof. Firemen rushed to rescue them. Although 100 feet above ground, an aerial ladder was swung into position and Chief Kenlon's aide, Lieut. Rankin, with two firemen (Molloy and Blessing) quickly sprang up the extended ladder, taking scaling ladders with them. Theirs was apparently a hopeless effort, owing to the wide cornice that encircled the building, and Chief Kenlon had the crew of Ladder 1 with Acting Chief Kelly, try to shoot a life line, against the wind, to the three victims from the 9th floor of a building across Cedar Street. The line was fired and fell true. The men were in the act of hauling it in when that section of the roof collapsed, the three unfortunates plunging to death.

Another tragedy was the death of Battalion Chief William Walsh of the 2nd Battalion. At the time Chief Kenlon ordered all hands to back out, Chief Walsh ordered his men to leave but he waited to the last moment to insure his men's safety and was caught when a water tank on the roof, loosened by falling girders, crashed through the upper floors, the wreckage catching the Chief a few feet from safety.

Two other men, both watchmen of the Mercantile Safe Deposit Co., lost their lives when the floors of the Broadway and Cedar Street corner structure collapsed.

At about the time of the collapse that brought death to Chief Walsh, drama was being enacted elsewhere. William Giblin, head of the Mercantile Trust Company, had been summoned to the fire earlier and had made his way down to one of the huge vaults below street level, accompanied by three of his employes. It was hoped to save valuable documents, but while the men were gathering papers to be salvaged, the crash that brought down upper floors sent burning debris hurling to the basement, blocking all escape of these men. In their extremity the victims managed to reach the basement grilled windows where they attracted the attention of Firemen James Dunn (now Chief, 8th Battalion) and Seneca Larke of Engine 20, former iron worker (and the only Indian in the department), who, by a quirk of fate, had helped install the Mercantile Trust vault. He knew the best method of forcing the bars. Dunn, then aide to Chief George Kuss, secured hacksaws from the engineer of the Singer Building across the way, and then the terrific struggle started.

For eight hours, in biting cold, Larke worked with Chief Kuss at his side and with Dunn's helping. Giblin and his employes were unconscious. But Kuss, Larke and Dunn ignored the danger of falling walls and with water turning to ice on them, hands bleeding, they worked on. At last two bars finally gave way and were bent aside by rescuers. The imprisoned men were revived by ambulance doctors at the scene.

At 7:48 P.M., in order to provide further heavy streams for the leeward side, while taking the offensive on the fire, Chief Kenlon transmitted a borough call, 7-7—24—33—39, which brought companies to the fire (box 24) which were normally assigned to respond to box 39, Borough of Brooklyn.

These reinforcements of Engines 108, 105, 106, 107, 156, 126, 104, 103, 124, and Ladders 68 and 60, in charge of Deputy Chief Lally, helped turn the tide. This brought the total to thirty-one engine companies and ten ladder trucks in action. Chief Kenlon then called a boat tender (since discarded in the department) to stretch 3½-in. hose from the high-pressure hydrants to the Broadway front of the building. Three-inch lines were also taken into the Cedar Street buildings opposite the vaults to help develop heavy streams to offset the gale which continued to increase.

At 9:30 the fire was controlled. It smoldered for some time and fire forces were employed to wet down the ruins for many days.

Analysis of the fire disclosed that the fire department's operations were handicapped by several circumstances, all of which taught their lesson and brought legislative reform and local improvement. The city's High Pressure system, which then extended only as far south as Maiden Lane, was extended to its present limits. Fireproof construction became a subject of scientific research and the relation of temperatures to building materials, such as steel columns, were studied and their characteristics to withstand effects of graded temperatures determined. Fire walls and fire partitions were not only defined but prescribed. Strain and stress and floor-bearing capacities were studied. Fire

Equitable Building Fire Made Department History

Burning of the Equitable Building, February 9, 1912, with loss of six lives, resulted in improved regulations governing use of combustible building materials, standpipes and sprinklers. Picture shows operations on Broadway side shortly before men and equipment were withdrawn.

tower, sprinkler and standpipe laws for safeguarding tallest buildings trace their development to this historic fire.

Fatal Armory Conflagration

Early on the morning of Washington's Birthday, 1902, a patrolman saw flames coming from the north windows of the 71st Regiment Armory, a three-story brick and stone structure with a lateral area of 200 by 225 feet, located on the east side of Fourth Avenue, extending from 33rd to 34th Streets. The officer pulled Box 446 (now 716) which brought Battalion Chief George L. Ross, 8th Battalion, a first alarm assignment. At 1:33 A.M., three minutes later, Chief Ross transmitted a third alarm.

The fire had gained great headway, and, with the serious exposure hazards and the dangerous contents of the Armory itself, the department had its work cut out for it from the start. The streets were filled with snow; a northeast gale was blowing and it was cold and rainy. A sizeable excavation along Park Avenue, just west of the Armory, marking the construction of the I.R.T. subway, was a further hindrance. To leeward, on the downtown side of 33rd Street, was the rambling car barns of the Metropolitan Street Railway. On the west side of Fourth Avenue, from 32nd to 33rd Streets, was the Park Avenue Hotel, erected in the early 1870's. This was a seven- and eight-story iron and brick structure built around an interior court, devoid of fire escapes, with Mansard roof, brick filled and slated on iron frame. Skylights were thin glass on metal frames. There were two passenger elevator shafts, one on either side of the main stairway, extending from basement to roof. They were of brick construction but had wood and glass doors. Windows on each floor level, of wood and glass, pierced the walls facing the court for light. At the end of each of the two wings of the Hotel was a fireproof stairway for emergency use. The structure was not equipped with standpipe or sprinkler systems. The only auxiliary fire-fighting tools were a few extinguishers.

The hotel was directly in the path of flaming brands and sparks carried by the gale from the armory fire. Despite this, guests of the hostelry were not alarmed, and they filled windows to watch the work of the firemen.

Firemen forced the huge doors of the armory on 34th Street, following which a terrific backdraft blew many of them out into the street. Hose lines were taken to the roof of the car barns to prevent its ignition, and as a vantage point for heavy streams which were directed into the flaming armory. By then the lofty tower of the armory was ablaze and threatened to fall. As flames burst through the structure's vast roof, flames shot skyward and sparks were carried afar. Then, shortly after 2:00 A.M., a shattering explosion occurred as 1,000 lbs. of gunpowder stored in the cellar let go. With this, the south wall of the building collapsed.

At 2:10 A.M. a fourth alarm was struck for added help to stem the advancing fire. Then, at approximately 2:45 A.M., the Hotel Park Avenue was discovered on fire. Five minutes later Chief Edward F. Croker ordered the fifth alarm transmitted.

First intimation of the pending disaster in the hotel came from a woman who was heard screaming at a fifth floor window. The flames were noticed issuing from windows at the northeast portion of the building at the third floor level. Firemen immediately revised their strategy to combat this new threat. Lines were taken into the lobby where the elevator shafts, with wooden, greasy rails, were burning. Apparently sparks had found entrance into the shafts and ignited combustibles. Fire mushroomed out of the shaft on the sixth floor and the main staircase from the sixth to seventh floors was destroyed. An extremely heavy smoke condition developed on the upper floors, which was no doubt responsible for many of the twenty-eight fatalities. Some persons jumped to the icy pavements. Others were suffocated and burned. A sheet "fire escape" failed one victim who fell to death in the court. Unfortunately nearly all the occupants failed to use the two end emergency fire stairways.

Firemen advanced lines up the stairs under gruelling conditions. Former chief of department John Kenlon, then captain of Engine 72, responding on the third alarm, describes the punishment taken by firemen in his book "Fires and Firefighters." However, the fire was soon brought under control.

Said *Fire & Water* (now FIRE ENGINEERING) editorially on March 1, 1902 after the disaster: "The whole disaster was . . . a repetition of the Windsor Hotel horror . . . when the (hotel) help, instead of being on the lookout for the protection of guests, were gaping out from the windows or standing idle on the sidewalk staring at the St. Patrick's Day procession. The holocaust was the third of the same class as that of the Windsor Hotel already referred to, and that of the Hotel Royal on February 2, 1882—three holocausts which watchfulness combined with proper equipment might easily have avoided. Apparently . . . New York hotelkeepers hate to be reformed, and equally despise every warning, whatever precedents for both may be placed evidently before their eyes. . . . The aid of the legislature must therefore be invoked and a law be passed, which shall enact not only that every hotel shall be provided with fire escapes and proper fire equipment and the help be drilled by an expert fireman in the use of that equipment, but also that there shall never be a moment, day or night, when the basement, halls, and stairways shall be left unpatrolled by a corps of watchmen, with strict injunctions to be sober and vigilant, and always on the lookout for any cause that may give rise to panic or other danger."

The editorial concluded with this further injunction: "Such a precaution, it will be urged, will cost money. Granted; but, even if every guest has to pay twenty-five or a few more cents a day, the money will be well spent, if thereby such fearful holocausts may be avoided in the future."

Greenpoint Oil Fire

The city's worst oil fire, and one of the toughest and longest ever fought by the paid department, happened on Saturday afternoon, September 13, 1919.

The fire was discovered by a watchman at the top of tank No. 36 in the Standard Oil Company's twenty-acre refining plant and storage yard, congested with 28,000 barrel tanks of oil. He promptly notified the plant fire brigade, which responded. But before it could get into action, a huge explosion, attributed to gases igniting in the tank, rocked the area. It broke the eight-inch pipe used for filling and emptying the tank, making useless the shut-off valve and burning oil flowed through the open valve, flooded the yard and ignited surrounding tanks.

Because there were no dykes to stem this flood and because of the large number of tanks almost immediately involved, the steam and foam systems, all above ground, were ineffective. The high pressure water system in the yard was also ruptured by the blast.

Before the alarm had been sent to the fire department, the fire had spread to the northern end of the plant, approaching a unit of the U. S. Industrial Alcohol Co. housing several buildings of open joisted construction. There were no fire divisions and partitions generally were of frame except in the denaturing laboratory, a separate fireproof structure.

The fire quickly jumped to this plant. As with the oil plant, the fire protective equipment was quickly wrecked when the steel trestle supplying water for the sprinkler system crashed to the ground. There were no dykes here, either.

Tank No. 36 where the fire originated was located in the Sone and Fleming Works of the Standard Oil Co. plant on Kingsland Avenue. This was a typical oil refining yard of tanks, stills, agitators, boiler and pump house. One- and two-story brick and concrete pumping stations and boiler houses and steel and iron storage tanks dotted the 20 acres. The tanks contained crude oil, white oil, distillates, naphtha and kerosene.

The hazardous occupancy was recognized by the fire department and the company had installed strongest fire protective devices. Every tank was provided with steam and foam connections. To operate this system it was only necessary to start the pumps and manipulate two valves at the "header" of each tank. There was, further, a system of yard hydrants supplied by fire pumps, taking suction from Newtown Creek and ample supplies of fire hose. Most buildings had automatic sprinkler and watchman service.

The fire department received the first notification at 2:02 P.M. from box 810 located at Nassau and Haussman Streets. Acting Battalion Chief Woods, first officer to arrive, at once realized the seriousness of the situation and dispatched a second alarm at 2:08 P.M. Third and fourth alarms were transmitted by Deputy Chief Patrick Maher, from boxes 443 and 516 respectively. Upon the arrival of Deputy Chief in Charge, John O'Hara, a fifth alarm was sent from box 443 and from then on additional special calls kept the Brooklyn fire alarm bureau busier than it had ever been before.

By 3:00 P.M. the fire had extended to buildings on the south side of Greenpoint Avenue, to some northeast of that thoroughfare between Kingsland Avenue and Newtown Creek, and to industrial plants on Review Avenue.

With no dykes to check the flowing oil and because of the grade, firemen fought a losing battle from the start. At 2:39 P.M. two more engine companies were special called. Then, at 3:23 P.M. the first Borough call 77-516-33-389 was sounded by Assistant Chief Joseph B. Martin, who took charge shortly before, bringing all apparatus ordinarily responding to a third alarm from box

389 (Avenue A and 23rd Street) Manhattan, to box 516 at Greenpoint Avenue and Newtown Creek. These reinforcements were welcome!

Firemen worked in as closely as they could to the blazing tanks while fellow-firemen played hose streams on them to prevent their coats and lines from burning. The fire was also attacked from Newtown Creek, the fireboats McClellan, Strong, Hewitt and New Yorker (the latter since decommissioned) steaming as close to the blazing shore as they could and operating heavy streams. They also aided land forces by stepping up pressure. The Standard Oil Company sent nine of its tugs with fire-fighting equipment to help prevent the flames from crossing to the Long Island side of Newtown Creek.

Through his aide, Fireman Daniel Healy, Chief Martin transmitted a number of calls by telephone and telegraph. The water department was requested to step up its service. The Public Service Commission was also notified of the blaze. A special call was telegraphed for Boat Tender 2 from Lorraine Street (16-516-2). Two additional fireboats were summoned (Engs. 78-86) from Manhattan. Fuel Wagon 3 was special called (77-8-516-3) and Mr. Smart, superintendent of the oil yard, was asked to send company auxiliary tow boats—nine responding.

Deputy Chief Ross (3rd Div., Manhattan) was ordered to remain in that borough and hold all officers and men reporting at 6:00 P.M. and use all available spare apparatus to replace companies that responded on borough call 33-389. He was also instructed to load two spare hose wagons with hose and have them respond with complement of men to box 516 Brooklyn.

At 4:07 P.M. Eng. 232 was special called to box 516. At 4:07 P.M. six special calls brought hose wagons of Engs. 91, 31, 27, 13 and 7 (77-6-516-91, etc.) to box 516. Here, Chief Martin directed **them to stretch line across lots** from North Henry Street to engines which had been located there for them by chief officers. Fireboat crews assisted in these operations. In addition, men reporting at 6:00 P.M. to Brooklyn companies were ordered to take hose wagons at the fire, proceed to the nearest fire stations and load up and return to the scene.

By 5:00 P.M. the region was an inferno. Exploding tanks continually threatened firemen, who were relieved every ten minutes, the maximum time any man could stand the heat and fumes. A further source of danger was the hundreds of tons of coal stored in the yards, which ignited during the afternon. The most critical period came at 8:30 that evening when two large tanks of naphtha exploded despite the cooling streams of hose lines, nearly killing or injuring several entire companies of firemen.

At 9:30 P.M., notwithstanding the concentration of effort to prevent it, the fire jumped Newtown Creek when a tank containing 28,800 barrels of oil exploded its contents, forcing a flood of blazing oil across the waters into Long Island City. This extension cut off two companies of fire fighters stationed at the water's edge. The creek itself was full of flaming oil and the drawbridge had been destroyed by fire. In the nick of time a fireboat fought its way through the flaming oil and removed the endangered men.

New York's Worst 'Area' Conflagration

Arverne, L. I., devastated on June 16, 1922, with destruction of 500 homes in sixteen-block area. This was first fire in which city's newly motorized equipment was called on to travel long distances (some of it falling by the wayside).

When the fire crossed the creek, borough call 77-516-33-577 was transmitted by Chief Martin—at 9:55 P.M. This brought Manhattan forces that would normally have responded to a third-alarm for box 577, 2nd Avenue and 57th Street, that borough, over the Queensboro Bridge to the bridge which spans Newtown Creek at Greenpoint Avenue and the bulkheads on shore and four small buildings.

At 10:20 the recall signal for firemen of the off-duty platoon was sounded (for the first time in the fire department's history). At 10:40 Engs. 258 and 262 were special-called to box 516.

All through Sunday the struggle continued. By Monday morning, over forty hours from the first alarm, the fire was reported under control. Families that had been evacuated from the heavy residential section surrounding the fire area were permitted to return, and the department took stock of its losses, which consisted of miles of hose and some apparatus.

Investigations following this fire disclosed many factors of possible danger from fire in such industrial plants, and resulted in the passage of legislation making mandatory many safety improvements in wide use today.

Arverne Conflagration

June 15, 1922, marked a busy and tragic day in the New York Fire Department. The action centered in the Rockaways, popular summering place of New Yorkers. It began with a fire that practically destroyed the home of Lillian Russell of stage fame, taking the lives of two firemen—one, Emmet F. Donnelly, Ladder 134, instantly killed by a falling chimney, and Adrien B. Curnan of Engine 26 who had volunteered his services while off duty, died later in a hospital. Several others were injured.

Later that afternoon, while operating at this fire in Far Rockaway, Battalion Chief William E. Lawrence was notified of a fire in the Arverne section which had gone out of control and for which three alarms already had been requested by Captain Harrigan of Eng. 266, which company had come from the next town of Holland to fill in for Eng. 265, out at the time of the blaze.

This fire had originated in the Hotel Nautilus, 100 Beach 60th Street, from a carelessly discarded cigarette. The culprit, a painter, delayed sending the alarm while he futilely tried to stop the blaze. The first box alarm was received at 5:15 P.M. from "signal station" 4962.

On his arrival, Captain Harrigan saw large 20-room houses on both sides of Beach 59th and 60th Streets burst into flames as flying embers from the Hotel Nautilus ignited cedar-shingled roofs dried from the sun's rays. Without delay he ordered second, third and fourth alarm assignments.. Soon afterwards, Chief Lawrence tapped out a fifth and requested maximum pressure on the 16-in., 12-in. and 8-in. mains carrying the water supply of the Queens County Water Supply Company for the area.

At this point, although a fifth alarm had been transmitted a battalion chief still was in charge. Higher ranking chief officers, as well as the major alarm companies, all had to travel from the mainland to Rockaway, an isolated peninsula, a slow haul over the old Rockaway Boulevard and long and tortuous path through Far Rockaway and down to Arverne.

Engine Companies 267 and 266, with Ladder 121, first to arrive, were unable to reach the flaming hotel, in fact, were driven from their advanced positions under cover of a water curtain of Engine 265, which had just arrived. Men and apparatus of these units escaped safely but lost hose and hydrant connections to the onrushing fire. When Engine 265 attempted to follow, chased by the tornado of flame, their Christie Tractor failed and the engine was lost to the flames.

Twenty to thirty wooden buildings were being ignited as the air temperature rose to kindling point, and as the breeze carried heat horizontally over a wide area. Companies in its searing path were forced to retreat, in some cases **leaving host to burn. Boats out in Jamaica Bay** had to slip anchor to escape the heat.

Deputy Chief John O'Hara, in charge

of Brooklyn and Queens, upon arrival immediately called for gasoline pumping engines from Brooklyn as it was obvious at this stage that the department was faced by a conflagration of major proportions. Motorization of the fire department at that time was not complete. Further, the pumpers of that era had not been designed for such long runs. Many broke down en route to the fire.

As the fire raged through hotels, boarding houses, bungalows and spacious homes, all efforts of the firefighters appeared futile to stop the spread. The situation was desperate as Assistant Chief of Department Joseph B. Martin and Deputy Chief John Davin arrived. The former, assuming command, quickly mapped his strategy, which was to fight the fire from both sides. Chief O'Hara was ordered to take charge of the east flank and Deputy Chief Davin the west flank. But it wasn't so easy to mobilize the fire forces. Because of geographical difficulties, companies traveling from Brooklyn had perforce to approach the fire from the east side and to get to the west flank, they had to run the gauntlet of flame and heat at great risk. Engine 290 made the run through fire, with gasoline tank covered by a tarp', the men shielding their faces and hands as best they could as they sped over the melting asphalt of Rockaway Boulevard.

Chief Martin called four fireboats, boat tender No. 13, and asked the aid of ten boats from the auxiliary fleet. Anticipating the danger of a shift of the wind, he asked government authorities at Governor's Island for sappers and miners. The fireboat Mitchel was dispatched to transport men and explosives to Arverne, to be used in last-ditch efforts to stop the advancing flames. The Long Island Railroad was also asked by Chief Martin to be ready to transport needed pumpers on flat cars.

The fireboats, unfortunately, were of little aid to the land forces, owing to shallow water. Meanwhile relaying was resorted to, to reduce friction losses. Batteries of strong streams were brought to bear on the flanks and companies deployed to encircle the vast ring of fire and move inward on the blaze. When, about 9:00 P.M. the Boulevard became passable, additional streams were available to stop the western advance of flame.

First relieving companies were able to return to quarters after fifteen hours of intense fire duty. It was June 17, 7:00 P.M., before the men assigned to watch lines got the final order to pick up.

It was found that the area burned measured about 1500 feet long and three blocks, or about 800 feet, wide. It contained 13½ acres, with a total of 141 rooming houses, hotels and other structures. The estimated loss was $2,000,000.

This fire resulted in the enactment of legislation covering fire-resistive roofs, and establishment of an additional engine company in Far Rockaway. It also had a profound effect on the motorization of the department and its selection of automotive apparatus.

Skyscraper Blaze Brought Improvements

One of the most spectacular fires, and a tough one for the department to control, occurred on April 12, 1927, when wooden scaffolding girding the Sherry-Netherland Hotel, nearing completion at Fifth Avenue and 59th Street, caught fire at the uppermost level, resulting in a flaming beacon that could be seen for miles.

Five alarms, made necessary by the exceptional circumstances that prevailed, called out 41 department units, including Chief of Department John Kenlon, and seven other chief officers to forestall possibility of conflagration that menaced roofs over a wide area for almost nine hours.

The Sherry-Netherland is one of the modern fire-resistive type hotels, covering an area at its base of 12,000 square feet, with a 70-foot frontage on both Fifth Avenue and 59th Street. It rises 42 stories above street level. From 17th to 23rd floor, set-backs reduce the floor area to 3,000 square feet and a tower of this area rises 38 stories in height. This is topped by a cupola approximately 3 stories higher. It is 559 feet from street level to pinnacle.

There are two stairways, enclosed in hollow tile, from sub-basement to tower, with one carrying to the 38th floor through the tower. Four elevators extend to the 38th floor, with operating machinery directly above. Construction work had progerssed to where the exterior was practically finished except for the top portion of the tower. Extending from the scaffolding down a U-shaped court on the north side of the building to the first floor were two temporary material hoists, made of wood, 25 feet long and 12 feet wide. They contained considerable flammable material.

The fire was first noticed by a pedestrian who notified a patrolman, who in turn pulled Box 942 corner Fifth Avenue and 59th Street. This was at 7:46 P.M. The situation that confronted Battalion Chief James T. Ferris (8th Batt.) and Engine Companies 23, 39 and 8, and Ladder Companies 16 and 2, was unusual but not too perplexing. Fire was working around the north and east sides of the tower, feeding on the extensive scaffold lumber.

Chief Ferris ordered Eng. 23 to stretch two 3-inch lines into the standpipe and proceeded into the building. With his crew carrying 'doughnut' rolls he encountered the first serious difficulty. Not a single elevator had been placed in service. Investigation disclosed that the two material hoistways used by workmen were already involved by high fire and inoperative. There was

Sherry-Netherlands a Giant Pin-Wheel

Beacon fire on April 12, 1927, in 42-story hotel under construction ignited properties over wide area, gave five-alarm assignment hard fight and resulted in drastic changes in fire prevention and building regulations "A" indicates water tower stream.

nothing to do but climb 38 stories. This lost valuable time and left men who finally reached the 23rd story almost exhausted. And here another obstacle was encountered. The newly installed standpipe system proved useless. The plumbing contractor, keeping pace with the swift pace set by masons and steel workers, had two fine 8-inch risers in place from the sub-basement to the 23rd floor, with one riser continuing to a tank in the top of the tower.

Progress on the vital cross connection on the 23rd floor, however (and unbeknown to the firemen) had been interrupted that evening by the 5:00 P.M. whistle. Worse, still, the riser had not been connected to the empty tank and was uncapped.

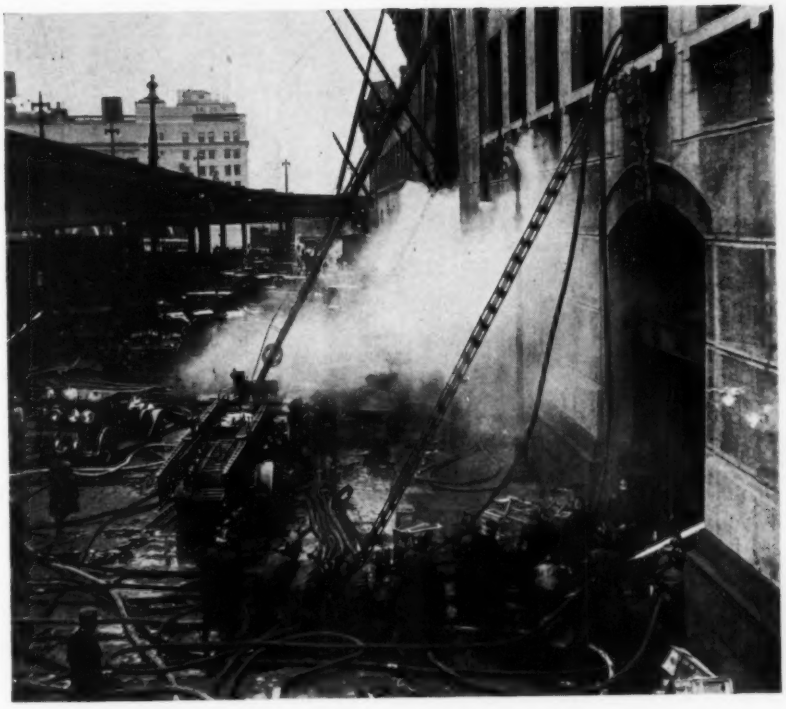
The tired firemen, arriving at the 23rd floor found the 8-inch cross connection spouting like an "angry geyser". There could be no hand lines from this essential source. Deputy Chief Carlock (4th Div.) notified of this handicap and alert to consequences, transmitted second and third alarms at 8:14 and 8:17 P.M.

The entire tower was now wrapped in flames and fire, fed by material on the two laden material hoists, was traveling downward and through the various floors, igniting al interior scaffolding, planking and litter in its path. Despite fast work by firemen to devise a temporary cross-connection they were unsuccessful and, although water was elevated to the top of the riser, it spurted free there, like a Niagara. Meanwhile, blazing timbers 4, 6 and 10-feet long, revolving like giant pinwheels hurled through the air, some for over a block, before landing. Many persons had narrow escapes from death from these fiery missiles. Crowds of spectators continued to grow, until the number was said to be 100,000, handicapping efforts of police and fire forces, and in some cases being menaced by flying brands.

Firemen who had made the climb were forced by the heat to retreat downward, floor by floor. Stairwells proved chutes down which blazing debris plummeted, carrying the fire to points below and endangering firemen.

When Assistant Chief of Department, Joseph B. Martin, arrived about 8:30 P.M., he surveyed the situation and all reports being unfavorable, he sent in a fourth alarm. Upon the arrival of Chief of Department John Kenlon, the latter transmitted the fifth alarm. By this time reports of small fires throughout the neighborhood were coming in and as rapidly as reinforcements arrived, they were detailed to cover surrounding roof-tops including residences of many of the city's most prominent citizens. The two upper floors of the 10-story Central Union Trust Building on the southeast corner of 60th Street and Fifth Avenue, occupied as luxurious apartments, were swept by flames. Fires in the nearby Metropolitan Club and in numerous stores along 59th Street kept companies on the jump. The Bureau of Fire Alarm Telegraph was almost swamped by phone and box alarms and inquiries but the cool-headed dispatchers handled them without confusion or error.

In more than a hundred instances, incipient fires were extinguished throughout the locality by firemen, and others. Bucket brigades were formed by nearby hotels and apartment staffs.



Cunard Pier Was Fire Department's Longest Sustained Battle
View of the shore-end struggle of some of the fifty fire companies (including seven fireboats) to control stubborn $2,000,000 blaze that started on May 6, 1932.

Water Tower 3, on Fifth Avenue, put up a high protective water curtain that reduced radiation and prevented extension to structures in close proximity. Special calls for the then new high pressure pumpers of Engines 35 and 99 were sounded. Lines were taken to the upper windows of the uncompleted Savoy-Plaza across the way but their streams were unable to effectively reach the fire. A stubborn stand was made by firemen on the Sherry-Netherland's 10th floor where hand-lines stretched up the stairways knocked out the fire at that point. Soon after midnight the final portion of the hoistway and scaffolding clinging to the south side of the tower tumbled into 59th Street, sparks flying wildly to injure some of the too curious spectators. Shortly after this, fire broke out in the sub-basement, and tired companies were dispatched to that subterranean area, where they fought a hot gruelling battle of over an hour.

At 2:00 A.M., Chief Kenlon reported the fire under control, although not out. Water had finally been taken aloft and strong streams continued long after dawn to wet down the scarred but still intact skyscraper. Its construction had helped the firemen eventually win their battle. It was bright daylight when the first-due company reached the topmost peak, the last three stories climbed on ladders, to give the final washing down.

The cause of the $200,000 fire was attributed to a tinsmith's charcoal furnace. The Underwriters stressed the need of laws that would prevent a repetition of such an occurrence. As a result of the lessons learned at the Sherry-Netherlands fire, reforms of great value to the fire service at least, have been inaugurated in New York City. Standpipe laws were revised to make them more adaptable to such buildings under construction; restrictions in the use of combustible scaffolding and insistence upon maintenance of elevators or other means of conveyance for transferring firemen and equipment to high levels were the major aftermaths.

Cunard Pier Fire

Said to have caused the New York Fire Department its longest sustained fight, the burning of Pier 54 North River of the Cunard Line on May 6, 1932, called into action seven fireboats, fifty fire companies and over 700 firemen, resulted in the death of one man, a spectator, and injuries to several hundred firemen, before it was controlled with the use of 84,000,000 gallons of water. Loss to pier and cargo was approximately $2,000,000.

Pier 54, with companion piers 53 and 56, were built about 1910 to be the last word in pier construction. The superstructure was substantially of incombustible materials and the supporting structure was of the wood pile and girder type commonly used. There were, however, no subdivision of the area in the superstructure by fire walls and no fire bulkheads in the sub-structure, nor were there fire hatchways through the pier; there were no sprinklers.

The pier was about 100 feet in width and 945 feet in length. The bulkhead building was about 55 feet in width. Pier and bulkhead building were two stories. Pier deck and first floor of bulkhead structure were 2-inch asphalt on 6-inch concrete on heavy wood pine planking on wood girders and piling. Only a few sub-structure members were said to be creosoted. There was some bilge oil around the piling which augmented the combustibility of the piling

and made for smoke density. The second floors of pier and bulkhead were "Clinton" system of reinforced concrete 4-inch flat arches, on unprotected steel I-beams spaced 6-feet on centers on unprotected steel girders supported by steel side construction, and in part by interior unprotected steel columns. The pier sides were corrugated iron on unprotected steel structural work, backed by 4-inch tile. The west wall of the bulkhead building was corrugated iron on unprotected steel structural work. The east, or street wall of bulkhead building was concrete. North and south, the bulkhead building was continuous with open communications to piers 53 and 56. Cargo doors at the sides of the pier were wood, tinclad on both sides. Pier area was about 94,500 sq. ft. The finish was open except for wood stock racks between cargo doors on pier, and plaster on wire lath in offices of bulkhead building, and cement plaster on tile in waiting room. Roof was slag on 1½-inch planks, on wood sleepers on unprotected steel purlins, on steel trusses on side construction. The pier had a Texas skylight the full length of thin glass on wood frames. There were numerous stairs, elevators, escalators and merchandise chutes in pier and bulkhead structures, in various types of enclosures.

Pier 54, and its companion piers, were all open on first and second floors to the bulkhead building; there were no division or fire walls any where except for one concrete fire bulkhead under the deck between the bulkhead building and pier 56. There was 180 to 240 feet space between piers 53 and 54, and 300 feet between 54 and 57.

At the time of the fire the first floor of the pier contained much miscellaneous merchandise stocks. At the river-end of the mezzanine was a cooper's shop, stevedore room, wood lockers and storage of tarpaulins. The second floor of the pier was used as a passenger floor, baggage and waiting room. The first floor of the bulkhead building was unoccupied, except for boiler and engine rooms and coal bunker, with incinerator in the boiler room. Offices and waiting rooms occupied the second floor of this building.

The pier was protected by manual fire alarm system, watchman's service first aid appliances, a standpipe and hose system and there was a fire brigade. The equipment played no part in the fire struggle, except that a member of the brigade discovered the fire and used a small hose stream under the engine room floor in its early stages.

The fire originated under the first floor of the bulkhead building in the vicinity of the engine room, smoke being discovered about 30 feet north of the north side of the pier 54 and issuing from under the floor of the bulkhead building on the west, or nearest the river side. This was about 6:20 A.M. The pier guard who first detected evidence of fire also noticed a clouded atmosphere in the boiler room and the safety valve of one of the boilers was giving off some steam. At the time of the fire only two of the four high pressure boilers were in operation. No attendant was on duty, and the fires were supposedly banked.

The guard notified his superior who called an electrician, who in turn, attempted to reduce the fire under the boiler and also the boiler pressure. The guard then sent for a boat at the end of pier 56 but it was too heavy and men couldn't launch it. A pontoon then was secured, pulled alongside the boiler and engine rooms and a ladder was let down to the pontoon, down which the guard descended. He could see no fire under the floor of the bulkhead building, he reported. At this time the stream of smoke coming from under the side of the bulkhead building was between two and three feet in width.

A hose line was operated from the standpipe system through a boiler room window and the guard tried to hit what he thought was the base of the fire but the smoke became thicker and water was turned off. Still no fire was seen. The water was turned on again and the smoke became still worse. The guard then sent back word to the office and a telephone alarm was sent the fire alarm telegraph bureau, which notified Engine 86, the Fireboat berthed at the head of pier 53, and land companies. The fire department clocked the first alarm at 7:30 A.M.

The fireboat crew, using a small boat, operated a stream beneath the bulkhead building and they and other firemen attempted to locate the seat of the fire. It was not until some time later that a fireman lifted a manhole cover at the entrance of pier 54 and first saw flames. One hour and three minutes after the first alarm, a second alarm was sounded, followed in ten minutes by a third and later additional alarms.

Standard Oil, and railroad tugs aided the fire department.

Despite all efforts, the spread beneath the bulkhead building for approximately 150 feet to the north and 75 feet to the south of pier 54, and under the entire length of the pier. The very heavy smoke given off, and at times the heat, caused heavy going for the marine and land personnel. Every expedient was resorted to in the effort to get at the creeping fire on the underside of the pier, but without success. Boat streams were useless, while on shore, firefighters had no visible enemy to fight.

Assistant Chief Thomas Dougherty, who arrived on the second alarm, took charge until the arrival of Chief John J. McElligott.

The fire, after assuming dangerous proportions soon extended throughout the sub-structure of the pier and fire fighters concentrated their efforts on preventing it from spreading throughout the bulkhead building to Piers 53 and 56. Lines were taken into the building from Eleventh Avenue and the Elevated express highway, which passes along that thoroughfare, was used as a vantage point for other streams. There was ample water, both from the high pressure system (the Gansevoort pumping station is only a short distance south of the piers), and from the low pressure system.

Confronted with the almost insurmountable task of cutting through the heavy concrete decking, the department called upon the Consolidated Gas Company for air compressors and pneumatic drills to open up the six inches of concrete so that distributors and cellar pipes could be used effectively. Men were relieved frequently in this cutting work and many were affected by the smoke and heat which at times almost melted rubber boots. Numerous holes were eventually made in the floors and water played upon the flames, checking their advance to other piers.

In the interim, the job of controlling the fire beneath the pier deck was left entirely to the marine fire fighters. Even when the tide lowered it was almost impossible to get fireboat turret streams on the fire owing to the small clearance. It was difficult and hazardous to work off rafts and small boats on the north or leeward side, but firemen tried it, taking severe punishment. Some firemen went overboard from these extemporaneous floats and narrowly escaped drowning.

At 6:25 P.M. the day of the fire, almost twelve hours after the first alarm, a section of the pier settled into the river. By 7:30 the entire pier for a portion of about 120 feet at the land end, had settled into the river. The fire department continued to fight the stubborn fire under the floor of the bulkhead

Most Disastrous Fire to Fire Department

The explosion and fire in the sub-basement of fashionable 41-story Ritz Towers, Park Avenue at 57th Street on August 1, 1932, brought death to two lieutenants and six firemen, injuries to scores more.

building and this was not completely extinguished until over thirty hours after its discovery.

At 5:33 P.M. the recall signal 6666 was sounded in all fire stations to keep men on duty. At 7:49 next morning (May 7) the release signal 4444-9 was tapped, but Chief McElligott called for sixteen men each from Divisions 5, 7, 10, 11, 12, 13, 14 and 15 to report at the fire. Assistant Chief Daugherty put in twenty hours fire duty without letup.

The fire and loss resulted in a re-evaluation of pier construction and fire protection facilities. The report of the New York Board of Fire Underwriters says: "The proportions of the fire were beyond the control of the Fire Department and the Fire Patrol was unable to take any steps toward saving the merchandise on the pier. There was a fireboat moored to Pier 53 and the West Side Pumping Station was located only a few blocks away. If this loss is typical of the damage that may be expected in a pier substructure, then there is grave reason for fire underwriters to feel uneasy, not alone in unsprinklered piers but also in piers that have sprinkler protection." The report then commented on the delay in turning in the alarm, and criticized the interval between the first and second alarms, as well as the failure of fire fighters to get at the fire from below, claiming that at the time the fire was discovered there was a space 6' 3" between the surface of the water and the under side of the bulkhead building floor, "which permitted ready access to the substructure of the bulkhead building from the river side." "At no time during the fire" said the report, "was space at this point less than 4' 3" and this was at high tide at 9:35 A.M. or two hours and forty-two minutes after the first alarm."

The Underwriters recommended that "existing piers similar to Pier 54 should be made to conform to the recommended good practice requirements of the National Board of Fire Underwriters for the Construction and Protection of Piers and Wharves, especially with respect to the installation of sprinklers, the construction of fire walls and fire bulkheads, fire hatchways and openings in pier deck for revolving nozzles, cellar pipes, etc."

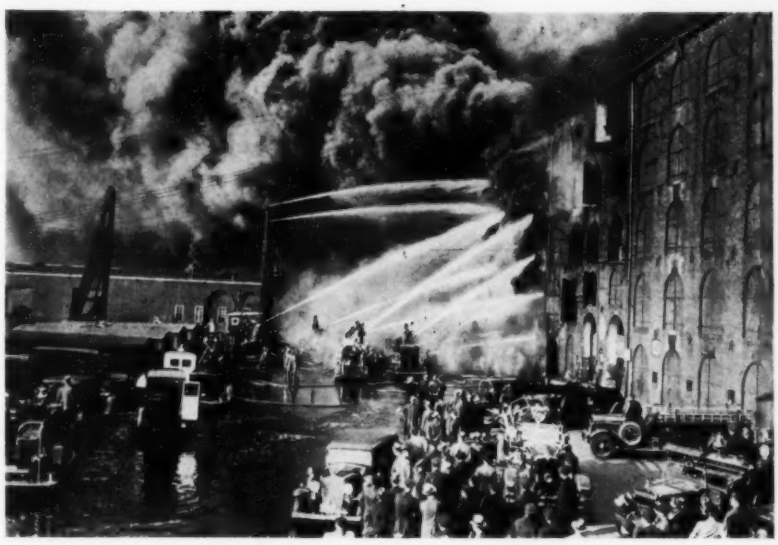
The cause, never determined, was variously attributable to heat convection from a high pressure boiler, or incinerator. The Underwriters report, however, sets aside this cause, but points out that although heat transfer from boilers set on piers, over masonry have caused fires, the same conditions have not been found so frequently on land installations, and attributes the difference to the fact that movement and shock to pier structures apparently produces cracks in the masonry that extend all the way through to the deck.

Ritz Towers Fatal Blast

Eight firemen were killed and over a score injured following an explosion that occurred during what was otherwise considered an ordinary fire on August 1, 1932, in the sub-basement of the fashionable 41-story Ritz Towers Hotel, 57th Street and Park Avenue.

The Hotel, located at the northeast corner, was built in 1926. It is of "fire resistant" construction and was occupied at the time on the first floor by a jeweler's shop and other retail stores.

The fire, which preceded the blast, was discovered by the engineer who noticed smoke coming from a hollow tile paint vault 9 x 6 x 9 feet in area, part of a storeroom on the sub-basement level. The store-room itself measured 30 x 45 x 12 feet. The paint vault was not vented to the outer air and contained paints, kerosene, gasoline, turpentine, varnish remover and other flammables. The paint foreman was last in the vault at 9:45 A.M. and his office (5 x 6 x 8 feet) adjoined it, being built of the same tile construction. There was one electric light in the ceiling of the vault, protected by a wire screen. A single door led into the general store room which itself led out under the sidewalk where the ash hoist shaft arose from the lower levels to the walk, outside the building line. The shaft had unpierced walls.



Niagaras Required to Control Furman Warehouse Fire

Setting a record for stubbornness, the Furman Street warehouse fire of April 20, 1935, called 620 fire fighters into action, 149 of whom required medical attention, as did over 900 civilians who were affected by smoke and fumes from burning tons of rubber.

The engineer attempted to attack the fire in the paint vault with a house line but the smoke was too dense. He called the chief engineer but they were only able to get as far as the foot of a short flight of six stone steps leading from the top of the service stairs to a short elevation on which were located the general store room, paint vault and trunk storage rooms. Unable to fight the fire, a man was sent to transmit an alarm, which was received from a street box (918 Lexington, 57th Street) at 10:36 A.M.

This brought Engines 26, 8, 25 and 39 and Ladders 2 and 16, two Battalion Chiefs, Acting Deputy Chief Roche and a unit of the Salvage Corps.

Engines 8 and 39 stretched down the service stairs, leading from 57th Street side but smoke was impenetrable. Rescue 1 was special called when it was seen that punching holes in the floors to get distributors and cellar pipes to work would be impossible under the punishing conditions. Meanwhile heat and fumes banked up through the sub-cellar area.

Upon the arrival of Rescue 1, men were ordered in with masks, and a 35-foot straight ladder was dropped down the sidewalk ash hoist to the sub-cellar level. The crews of Eng. 65 and Ladder 2 descended this ladder with a line of hose. They forced the sub-cellar doors leading from the bottom of the hoist shaft and almost immediately the blast came. This was at 10:56, at which time clocks in the building stopped.

This crumpled hollow tile partitions; twisted the ash lift; ruptured the ammonia system consisting of two 15-ton machines; pulverized plate glass on the street level stores, scattering jewelry into Park Avenue and littering the walks and street with miscellaneous debris and glass. Trunks and other stored material took fire at once.

Most of the firemen down the shaft or caught in the corridor near the vault, were killed instantly or died before midnight, by which time the toll had reached seven. The eighth fireman died eighteen days later from injuries.

A second alarm was immediately sounded with special calls for the Fire Department Ambulance and six public ambulances. Rescue work was prompt and thorough, although Fireman William E. Pratt, Ladder 7, who had been detailed to Ladder 2 was at first not accounted for, was not found for over an hour after all casualties had been removed. Despite all efforts at resuscitation, he died after removal to the hospital.

Second alarm firemen attacked the fire and aided in the rescue operations. The fire itself never extended beyond the general storage room and adjoining trunk room. The explosion, however, wrought much havoc; the elevators stopped; the ceiling of some stores fell; the grill room on the cellar level was demolished and lobby ornaments were dislodged.

Assistant Chief of Department Dougherty was in command of the fire forces after the second alarm, Chief McElligott having just started his vacation that morning.

The dead were: Lieut. John E. Cosgrove, Eng. 65; Lieut. James Hartnett, L. 16; Firemen Peter A. Daly, Eng. 39; Thomas S. Finn, Eng. 65; James F. Greene, Eng. 65; Louis Hardina, L. 16; William L. Pratt, L. 7 (detailed to L. 2), and Edward Maloney, Eng. 39.

On August 28 the District Attorney

(*Continued on page* 578)

Texas City: A Lesson in Oil Tank Fire Fighting

By HENRY B. PETERSON
Chemical Engineer, Naval Research Laboratory

IMAGINE 250 five-ton blockbusters exploding at the same time in the center of one of this country's most hazardous concentrations of industry and you will have an idea of the terror and destruction that befell Texas City, Texas, on 16 April 1947. Entire plants were leveled so completely that nothing left standing was higher than one foot above the ground. The same blasts that caused this devastation sent red hot steel fragments of the exploding ships over half a mile to pierce the roofs of oil tanks, firing two tank farm areas, one of which raged uncontrolled for over forty-eight hours.

The Softening of the Tank Shell when the Fire Was at a Low Level Has Caused It to Collapse Carrying the Foam Chamber in with It.

It was immediately realized that the disaster offered unusual opportunity to study disaster conditions such as might result from a wartime bombing raid or bombardment of our fuel storage areas. Furthermore, since most of these installations were protected with the very best of present-day conventional fire fighting apparatus, it was felt that first-hand observation would tell just how reliable such apparatus had proved to be. The U. S. Navy has been interested in this aspect of tank protection ever since the start of the war when the British experienced considerable difficulties with their foam systems. Therefore, in order to investigate the matter further the writer was sent into Texas City as a technical observer for the Naval Research Laboratory.

The boat docked at a battered pier on the morning of 19 April, having come across the Bay from Galveston. After a brief inspection of the dock area, attention was turned to a heavy column of black smoke arising to the south. Further investigation established the source as a 55,000-bbl. tank of bunker fuel oil on fire, the ninth large tank to burn in this farm. Its contents had become ignited the previous day when, during the slop-over of a neighboring tank, its wooden roof had caught fire. Since only a few scattered fires still burned in the dock and chemical plant areas, full attention could finally be turned toward extinguishing this last burning tank.

View of Eastern End of Tank Farm. The Elevated Tanks at the Center Are "A" and "B" Solution Tanks for a Wet-Solution Central Foam System.

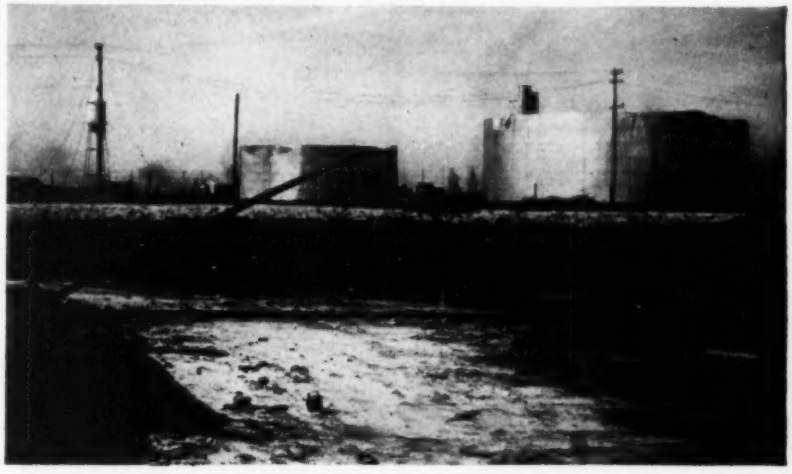
The oil level in the tank at the time of the heavy ship explosions was high so that the tank shell and the two foam mixing chambers attached at the top sustained little damage. This made it possible to utilize the tank farm's central foam system which was of the wet solution chemical foam type. The tank had been burning 24 hours and there appeared to be a heat wave about three feet in depth at the time the foam system valves were opened. However, when after 30 minutes of presumed operation there appeared to be no dimunition in the intensity of the flames, an emergency arrangement using a portable D-75 hopper for chemical foam powders was set up. The two discharge lines from the hopper were

The Remains of a 10,000 Bbl. Hortonsphere Containing Propane. The Neighboring Hortonspheroid Survived Intact Although There Were Numerous Dents in the Shell.

connected into the manifolds feeding the same topside foam chambers. Water was relayed from the Bay about 1,000 feet in order to supply the hopper. Within 20 minutes after putting this apparatus into action the fire was being forced back from one side of the tank and in 65 minutes it was completely extinguished.

Seven men were required for supplying the hopper with powders, and approximately ten tons of powder were consumed altogether. The rate of application was 0.4 g.p.m. of foam per square foot of burning oil surface, which means that sufficient foam was added to foam a layer approximately 5 feet deep. That only 1 to 2 feet remained despite the fact that the foam dropped only several feet demonstrates the large losses which occur in using a splash application (Type 2 Chamber). Such losses are caused, first, by strong updrafts carrying the foam up and out of the tank, and second, by the falling foam plunging beneath the oil surface and becoming contaminated so that a considerable portion of it burns. It can readily be appreciated that if the oil level had been low the foam losses might have been increased to the point where extinguishing could not have been effected.

When conditions permitted, a thorough examination was made of each tank in the disaster area to observe the condition of its fire protection equipment. Concussion caused the greatest amount of tank damage and was especially severe in the case of empty ones. This damage varied from complete collapse to slight warping of the plates with the foam apparatus being impaired in proportion. Tanks not in use but which had been filled with water remained in good condition. In some instances the blasts had torn foam chambers and their solution lines entirely clear of the tanks (see illustration). Many of the smaller tanks with integral bottoms had been bodily shifted up to 6 feet off their bases, which was enough to snap off foam risers (see illustration). In cases where the initial oil content level was low or conditions prevented approach until the level had burned down, the intense heat softened the shell to a degree where it collapsed, dragging the chamber over into the tank (see illustration). These results bear out the British wartime observations and the opinions of the U. S. Naval authorities that present accepted tank fire protection methods are too susceptible to damage under severe conditions.



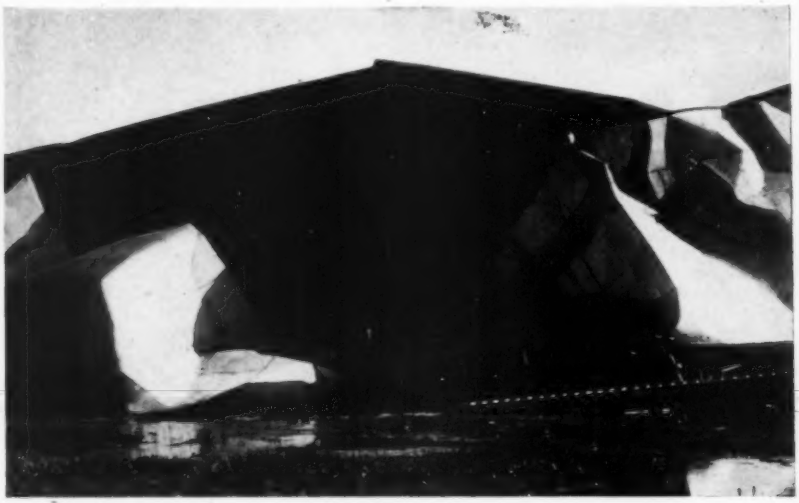
A Topside Chemical Foam Mixing Chamber and Solution Lines which Have Been Blown Completely Off the Tank. The Chamber Lies on the Ground at Right Center.

This Demolished Foam House Is Part of a Central Chemical Foam System Supposedly Emergency Equipment in a Safe Location.

The Foam Riser of a Single Power System Has Been Broken Off by the Shifting of the Tank.

In contrast there was no evidence of structural failure or other damage that would have prevented the use of a subsurface injection system. In this method, which has been developed largely by the Engineering Research Section, Chemistry Division of the Naval Research Laboratory, mechanical (air) foam of definite characteristics is generated under pressure and introduced into the burning tank near the bottom, either through the product line or a special foam inlet. The sound condition of product line connections at the tank bases proves that this is the logical location for the attachment of any fire fighting device. Furthermore, since the subsurface injection system allows all foam lines to be buried under a protective cover of earth, they are relatively free from blast and shrapnel destruction.

The advisability of central systems for foam distribution is to be questioned after seeing two installations in Texas City. One, a two-solution system, had its powder storage house demolished even though it was in a "safe" location. The second was a wet chemical foam system and, well laid out as its distribution lines were all underground, and the self-contained water supply was elevated to operate by gravity in case of power failure. However, the advantages were nullified by locating it among the fuel tanks. Thus, when the latter caught fire, not only was the station inaccessible, but the solution tanks were subjected to excessive heat. This is more than likely the reason why the system did not function when tried during the fire fighting operation previously described. (The bicarbonate or "B" solution is unstable and deteriorates at temperatures above 110°F.). It is to be concluded that any central system must be adequately backed up by portable, self-powered apparatus.



Steel Fragment of the Type Landing in the Tank Farm Areas. This One Narrowly Missed the Pump House in the Background.

Portable foam towers were successfully used in extinguishing several fires in small tanks 20 and 30 feet in diameter. While this method has value as a last recourse, its use is not favored because of the extreme hazard to personnel required to work inside the berm area. It is especially undesirable for the Navy, as its widely used fuel oil, Navy Special, has a high rate of heat wave propagation and a bad boil-over characteristic. Only a few years ago such an incident occurred in one of these same tank farms when seven men were trapped and burned to death in a slop-over. The subsurface system is ideal in this respect, as it may be operated at safe distances from the fires.

The one factor that proved to be the greatest obstacle in combating the tank farm fires at Texas City was the lack of roads and access to the area involved. There were ample supplies of equipment and man power but as the only approach to the area led through the waterfront, which was completely afire, they could not be utilized. The simplest kind of

(*Continued on page* 584)

Damage to Empty Tanks by Concussion Was Severe. This 55,000-Bbl. Tank Was Approximately One-Half Mile from the Ship Explosions.

How New York Keeps Its Fire Apparatus Rolling

Well Equipped and Fully Manned Repair Shops Prove Valuable to Fire Department

Editor's Foreword: **There is a phase of the business of fire fighting that is little known, not only by the public, but too frequently by members of the fire service themselves.**

It is the prosaic, of fire fighting, as unromantic as the work of a garageman. Yet upon this factor depends in great measure the successful operation of the municipal fire departments of the country. We are referring to the business of maintaining and repairing the apparatus and equipment, the rolling stock of the fire service.

There are over 65,000 automotive vehicles, and countless pieces of fire fighting equipment, that must be maintained at top efficiency in the tireless battle with destructive fire. And the maintenance problem is particularly troublesome in this post war period when so much of our fire fighting facilities are war-worn and over age, and when it is difficult for municipalities to get and keep skilled artisans and workers.

The problem is intensified, too, by the difficulty in procuring not only new apparatus and equipment but replacement parts and components for rolling stock of ancient vintage.

It is little wonder that the unlovely business of conditioning over 800 automotive vehicles, from chiefs' coupes to the latest pumpers, and 200 miles of hose, not to speak of thousands of other contrivances of the modern fire control expert, necessitates the expenditure in New York City annually of more money than it takes to operate the entire paid fire departments of hundreds of sizeable communities.

This "business" and its home—the mammoth new maintenance and repair shops of the New York Fire Department—will be the Mecca of many visiting fire officers during the August Convention of the International Association of Fire Chiefs. It is hoped that this story of this newest development in the fire service will prove instructive and interesting to not only those who are fortunate enough to visit New York, but to those who must do their researching at home.

FIRE ENGINEERING acknowledges data and illustrations from the New York Fire Department. Special acknowledgement is made to Fire Commissioner Frank J. Quayle; Chief of Staff and Operations, Frank Murphy; editors of the Fire Department publication "WNYF"; to Fireman Ray Hellreigel, Official Photographer and Fireman Walter Beatty, Official Curator of the Department; and particularly to Acting Chief of Battalion Arthur Jones, who besides being in charge of personnel of the Division of Apparatus is also a member of the Department's Board of Fire Apparatus; Board of Inquiry and Board of Testing Fire Apparatus and Equipment. Special thanks, also, are due Acting Battalion Chief Harry Irwin, Supervising Engineer.

* * *

WHEN the Metropolitan Fire Department was organized in 1865, the immediate and pressing problem was the conversion of the then existing apparatus of the volunteers to the needs of the paid organization. This meant, chiefly, from hand-drawn to horse-drawn and the building of new hose tenders, and ladder trucks on which men could ride with equipment to fires, instead of having to run on foot.

Thus, from the inception of the professional fire service of the City, it has been necessary to call in the trained artisan and craftsmen to support the fire-fighting personnel.

The first Repair Shops were established at 21 Elizabeth Street, where thirty-four mechanics were employed under Superintendent of Repairs, H. A. Gilbertson. Assistant Chief Joseph L. Perley was assigned by the Commissioners to supervise the work of the Shops.

In 1868, Chief Perley was relieved of the responsibility of the Shops and District Engineer Gilbert I. Orr was given the job; he remained in this assignment until 1879 when he was detached to command the Tenth Battalion.

In 1874, the Shops were moved to a new building at 128 Amity Street, later called West Third Street, and at the time they were moved, Foreman John McCabe was assigned as "Captain of the Repair Shops." He remained in that assignment until 1881 when he was promoted to Chief of Battalion. His successor was John Castles who had the title of "Captain of the Shops."

Captain Castles in turn gave way to Captain Patrick F. Ryan, who was given the title of "Chief of Construction and Repairs," on November 1, 1899. The last officer to hold this title was Charles Demarest, who resigned to enter the Army in 1917. When reinstated after the war, Chief Demarest was given command of a battalion by Chief John Kenlon and did not return to the Shops, which were then under command of Chief of Battalion Richard J. Marshall.

In 1904, the Shops were moved from West Third Street to the new building at Twelfth Avenue and 56th Street, where a large staff was kept busy ministering to the needs of the growing department.

With the advent of the first motor apparatus, about 1910-1911* the Shops

*The first automobile used in the department was the private property of Chief Croker. In 1904 the Commissioners authorized the purchase of two "automobile carriages."

Courtesy N. Y. Fire Department

Chief Edward F. Croker and Captain Bob Oswald in the New York Fire Department's First Automobile—1902

found a vast new horizon opening up. From the advent of Chief Edward Croker's "chariot" and the first gasoline pumping units of 1912, the terms "maintenance" and "repair" took on new meaning and responsibilities.

The building of the West Side Highway necessitated the demolition of the building housing the Twelfth Avenue Shops, and the Division of Apparatus, as that unit of the fire department had come to be known, was moved to a leased building in Long Island City. During the tenure of Chief John J. McElligott, Chief Marshall retired, and the command of the Division of Apparatus was given to Captain Herman Kuch with the rank of Acting Chief of Battalion.

Chief Kuch saw great strides in the motorization of the department, and in the growth of the Shops, which continued to take on new duties, not the least of which was the conversion of considerable old automotive apparatus and equipment to meet defense requirements of World War II and the problem of placing in service, and keeping them ready for action, of several hundred "O.C.D." pumping units.

Upon the retirement of Acting Chief Kuch, in June, 1943, the Division of Apparatus came under the jurisdiction of Acting Chief of Battalion Arthur J. Jones and the optimistic plans for a truly comprehensive Fire Department Maintenance and Repair Shops began to take form. The erection of the long-sought building to house this essential facility was begun in 1946, at Hunters Point Avenue and 34th Street, in Long Island City, which brings us up to the present.

Division of Apparatus

In order to gain the right perspective of the Shops, it might be well to briefly review the development of the "Division of Apparatus", of which the Shops is a major unit—its organizational set up and its multitudinous, if mundane, operations.

The Division of Apparatus is under the direct supervision and control of the Fire Commissioner and the Chief of Department. The Division, like other entities of the Fire Department, operates on a budget, of necessity a sizeable one. The requested budget for the year 1947 for example, including salaries, amounts to $1,078,488.00.

Some of the more important items in the budget may be of interest, viz:

Automotive parts	$ 18,413
Small tools and equipment...	6,000
Misc. operations and maintenance supplies	11,695
Fire hose	150,000
Motor vehicle material and repair parts	56,825
Equipment: new apparatus ..	450,000
Equipment Public safety masks, inhalator sets	7,955
Repairs to motor vehicles ...	35,000
Salaries of approximately 130 persons	332,450

The Division's budget is broken down and certain amounts allocated to respective functional items as above. Each of these various allocations is set up according to code number, for example: Code No. 57-149 being fire hose; No. 57-333, Life saving equipment, etc. Naturally, each Division of the Department is expected to keep within its allotted budget.

Budgets are prepared by Division heads and their assistants, usually in consultation with the Commissioner and executive heads of department who form the various Departmental Boards. They are then submitted to the Director of the Budget (the City Comptroller) and the Division of Purchases. The Division also prepares and forwards a quarterly report to the Director, covering expenditures in the various Code Numbers.

It should be mentioned that every specification for apparatus is reviewed with a mechanical engineer from the Comptroller's Office together with the buyer from the Department of Purchase, before any contracts are placed. Specifications, also, must meet the approval of the Board of Fire Apparatus and Equipment of the Fire Department.

Through long experience the Fire Department has established standards of design and construction covering most of its automotive equipment, hose and other appurtenances. Its specifications, therefore are rigid and all-embracing.

As a result of its long experience, the Division of Apparatus has fairly well definitized its functions and integrated them with the operations of the other Departmental Divisions, particularly the fire fighting forces. It is expected there will be little present change in either the organization of the Division of Apparatus or its administration and operation, when it is finally and fully established in its new quarters.

Courtesy N. Y. Fire Department

Interior of New York Fire Department Repair Shops in Use at the Present Time.

Courtesy N. Y. Fire Department

Fire Department Repair Shop—1874

Artisans of All Trades

The Fire Department Shops is so organized that it can do a complete job on any apparatus, either for repairs or rebuilding. This calls for a staff of specialized mechanics and craftsmen. At present the Shops includes 130 civilian employes, fifteen of them termed 'temporary.' The personnel includes among others, expert automobile

mechanics and enginemen; machinists; welders; blacksmiths; patternmakers; woodworkers; hose and tire repairmen; nickel platers; stationary firemen and engineers; upholsterers; wheelwrights and carriage painters and letterers. Experienced foremen employes supervise the more important operations, keep time records, prepare requisitions and so on.

The Shops are subdivided into lesser units or 'shops', each of which handles certain functions, about as follows:

AUTOMOBILE REPAIR SHOP: General overhaul and repair due to service or accident. In this connection there were 156 accident cases handled in 1946, which cost the department approximately $18,000.

PAINT SHOP: Repainting, touch-up and striping—quite a task to keep over 800 vehicles looking their best.

WOODWORKING SHOP: Repair and rebuilding of ladders, battery boxes life-net holders, etc.

BATTERY ROOM: Servicing approximately 2500 batteries yearly. The Department makes its own batteries to its own specifications (mostly heavy duty 12v. systems with plates specially thick).

HOSE REPAIR AND TESTING: Conducts acceptance tests.

BLACKSMITH SHOP: Makes new tools claw tools, punch-chisels, etc., for the department. Also straightens body frames, etc.

MACHINE SHOP: Makes new parts and handles repairs for motor vehicles.

FOUNDRY: Makes castings; repair parts; and casts bells.

PLATING: Does all necessary nickel-plating work.

UPHOLSTERING SHOP: Makes and repairs seat covers, life-net covers, life-belts, etc.

STORE ROOM: Storage of supplies, tools, equipment and surplus material.

One of the most important phases of the Repair Shops services is that performed by the Emergency Mechanics. In charge of a foreman, these men make all outside repairs, whether in company quarters or breakdowns on the highway. They also respond with the Acting Chief of Battalion in charge of the Division, to all 3rd or greater alarms of fire anywhere in the five Boroughs to be of service on the fire ground. The Emergency Crew, of about twelve men, is on duty twenty-four hours a day including Sundays and Holidays. The men carry special tools for repair work and minor adjustments.

An Army of Vehicles

Some idea of the magnitude of the task facing the Fire Department Shops may be drawn from the following tabulation of the number and kinds of motor vehicles at present in the New York Fire Department.

Parenthetically, it might be well to emphasize here the statement recently made by Fire Commissioner Frank J. Quayle, to the effect that over one quarter (25%) of the apparatus of the department is over-age.

Fire Apparatus and Other Vehicles Presently in Use in the N. Y. F. D.

Pumpers(including 5 Bridge Chemicals)	291
Ladder Trucks (65' to 85')	158
Hose Tenders	158
Water Towers	8
Rescue Apparatus	5
Searchlight Apparatus	4
Smoke Ejectors	2
Foam Supply Apparatus	1
Utility Emergency Truck	1
Air Compressors	2
Gasoline and Oil Supply (fuel) Trucks	3
Airport Crash Units	5
Ambulances	3
Wrecking Trucks	2
Tire Inflating Truck	1
Field Canteen Kitchen	1
Chief's Cars	142
Mechanics Emergency Trucks	39
Thawing Apparatus (hydrant service)	13
Station Wagons	5
TOTAL	814

This does not include every automotive unit because there are in addition some remaining civilian defense units, such as relay trucks and so on, and spare four-wheel tractors. In 1944 the department recorded 1512 motor vehicles of all kinds, including civilian defense equipment. Today, due to the war, the department is considerably short of its quota of apparatus although it is improving this situation rapidly.

Most of the facilities and procedures of the old Shops will be transferred to the Division of Apparatus's new home and in some respects they will be radically improved through the addition of new machinery and ideas developed by the Division. Thus, the advent of metal ladders will not presently alter the Department's custom of building its own wooden ladders. There are more than 3,000 ladders in use throughout the Department and, although it is difficult to secure lumber that measures up to the Shop's standards, particularly for the "big sticks" of aerial ladders, wooden ladders will continue to predominate in the Department for some time to come.

The formula for testing new apparatus will be continued, as will the general procedures for teaching and instructing pump operators. In this connection a further word about some of the Shop's methods may prove enlightening.

Shops Conducts Apparatus Tests

New apparatus are tested in accordance with departmental specifications. Pumping engines are subject to a 6½-hour pumping test for volume, pressure and endurance, after which they must pass a road test of 20 miles through city traffic. Further, they are subjected to hill climbing and brake tests.

Aerial ladder trucks (wooden ladders) are tested for hoisting qualities. In the past, the latter operation was required not to exceed 20-seconds, with bed and fly ladder fully extended in vertical position. A deflection test, with a 200-pound bronze weight lashed to the uppermost tip, is made on aerial ladders fully extended and at an angle of 45-degrees. The turn-table must rotate in a 360-degree circle without interference, after which the truck is subjected to an automotive test similar to that given pumping engines.

There is much more to the business of testing apparatus and appliances than this but its entire story cannot be told here. It should be added, however,

(*Continued on page* 584)

New York Fire Dept. Photo by Hellriegel

Air View of the New Fire Department Shops Now Nearing Completion.

Pictorial History of

DOWN through the ages the medical and scientific world has concerned itself with the problem of how to restore a person to life who, to all appearances, is dead.

Since early ages various methods have been attempted—most of them applying to drowned persons. Some of these methods are illustrated on this and following pages. Many of the ideas developed by surgeons, particularly those designed to produce compression of the lungs and develop what has been described as artificial respiration, had some merit. Some were responsible for restoring many lives. But most of them had one or more fundamental disadvantages.

It was not until the Royal Medical and Chirurgical Society in England appointed a committee to investigate all of the known methods and bring forward a report, that genuine progress was made in the technique of artificial respiration, or resuscitation, as some call it.

Professor E. S. Schafer (later Sir Edward Sharpey Schafer) presented his celebrated report in 1903 to the Royal Society of Edinburgh. In this he described a new method of artificial respiration which became known as the Schafer method. In his method the patient is placed prone, (face downward) and the operator brings pressure on the lower ribs. This brings pressure just below the liver, spleen and stomach, and presses these organs against the diaphram, making the patient breath out. The pressure is then removed and the organs return to their normal places and the patient breathes in. By the pressure, blood is also forced out of the large blood vessels of the abdomen towards the heart, assisting in the weak circulation.

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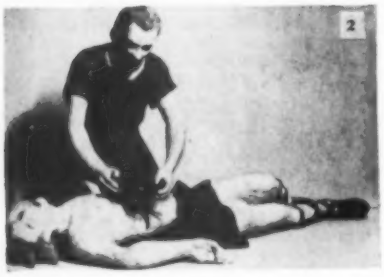
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1. EARLY AGES; Flagellation Method: Whipping with stinging nettles later supplemented by striking the skin surfaces with the hands and wet cloths, was considered helpful in restoring those apparently in deep sleep by inflicting pain.

2. EARLY AGES; Heat Method: Warmth and heat—warm ashes, hot water, burning dried animal excreta—applied to abdomen of patient, were thought of value in restoring heat and life to the cold body.

3. 1530; Bellows Method: Paraclesus was the first to use common fireside bellows to introduce air into lungs of apparently dead persons. Adaptations of this were used throughout Europe for 300 years.

4. 1711; Fumigation Method: North American Indians attempted to revive their apparently dead by blowing smoke into animal bladder, then into victim's rectum. Called also Dutch Fumigation. Introduced into England 1767. Fumigation used for years successfully in American Colonies.

5. 1770; Inversion Method: Used in England, Europe and America. Many successful cases of resuscitation from drowning are recorded. Pressure over chest aided in expelling air from lungs and inspiration resulted when pressure was removed.

6. 1773; Barrel Method: Used prior to 1767. May still be seen along water front. Barrel movement forward released on victim's chest allowing inspiration. Movement of barrel back caused body's weight to compress chest inducing expiration.

7. 1903; Russian Method: Persons unconscious from cold, fumes, apparently dead, successfully resuscitated by burial. Modification was to bury victim upright with head and chest exposed. Water dashed on face.

8. 1812; Trotting Horse Method: Used on Europe's inland waterways for resuscitation from drowning. Victim's body contacting horse, compressed his chest, forcing out air. When he was bounced from the horse's back, his chest expanded and air entered lungs.

9. 1829; LeRoy Method: This French physician was first to use the supine position for victim. Pressure was applied over chest and abdomen deflating the lungs. Removal of the pressure caused inspiration of air.

10. 1831; Dalrymple Method: Swath of cloth encircled chest, traction by the two operators compressed chest forcing air from lungs. Release of the pull, permitted chest to expand inducing inspiration.

11. 1856; Marshall Hall Method: First record

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Artificial Respiration

It isn't necessary to review here all the details of this effective method—it need only be said that the Schafer prone method has remained as the standard method in use today.

One factor to be considered in applying artificial respiration is the importance of getting to work on the patient as quickly as possible. Many a fire department rescue squad has had the satisfaction of bringing a victim around through prompt and persistent work in which artificial respiration was carried on in the vehicle while the patient is being transported to the hospital.

Perhaps the following suggested fundamentals to be followed to insure greatest success in artificial respiration may serve to refresh fire department personnel. We quote from an article by Wills MacLachlan, in "Health and Safety" published by the Boy Scouts of America:

1. Remove patient from water, gas or electrical contact as quickly as possible.
2. Start artificial respiration with well trained men, without a moment's delay.
3. Use warmth.
4. Continue artificial respiration until the victim breathes or there are definite signs of the onset of rigor mortis. Do not give up under four (4) hours.
5. After the patient is breathing, remove him to his home or hospital, put him to bed and treat as for surgical shock.

It hardly seems necessary to remind the fire service of the wisdom of learning and practicing (frequently) the prone pressure method of artificial respiration. Every fireman should be prepared to apply this service in an emergency, anywhere.

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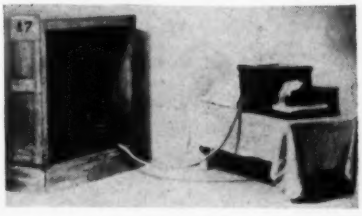
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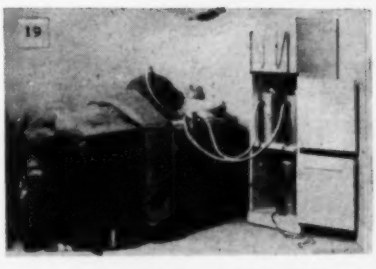
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of victim laid prone, chest elevated. Operator pulled patient on side, held him momentarily, then let him roll back. Pressure on back of chest expelled air. Pressure released by turning on side causing inspiration.

12. 1861; Sylvester Method: Victim on back, arms above head makes lung capacity greater for inspiration; arms carried forward, folded on chest and pressed to produce expiration. Tongue held to keep air passages open. Method still in use.

13. 1871; Howard Method: Pressure on back of prone victim, chest raised to expell water. Patient then turned on back, operator straddling and exerting pressure on upper abdomen and lower chest causing expiration. Releasing pressure causes inspiration.

14. 1886; J. B. Francis Method: Raising victim by hyperextension of the body induced expiration; lowering to ground caused inspiration. Method of little value due to possibility of injury to spine.

15. 1894; Prochownick Method; Inversion method applied to new-born baby. Pressure by squeezing chest and gravity induced expiration; release of chest compression lets air inflate lungs for inspiration.

16. 1903; Shaefer Prone Pressure Method: This simple method is in use today and requires but one person. Pressure applied to victim's back forces abdomen against diaphragm, compressing lungs and causing expiration. Release of pressure causes inspiration. Some 16 millions Americans have learned this method.

17. 1910; Ackkn Method: Device was strapped over lower thorax, upper abdomen; by manual operation, muscular walls were lifted by vacuum suction for inspiration; when manual pressure depressed, air was forced from lungs for expiration.

18. 1918; Stewart Method: First air-tight cabinet method. Chamber connected to bellows which created positive and negative pressure on abdomen, deflating then inflating lungs. This was initial "Iron Lung" type respiration of today.

19. 1926; Eisenmenger Method: Air pumped from electrically-driven diaphragm pump into pressure (expiration) and suction (inspiration) vessels causing within dome on patient's body, alternate positive and negative pressure to induce respiration in natural manner.

20. 1931; Pole Top Method (Oesterreich): The Pole Top method for linemen suffering from electric shock enables application of respiration at once, without lowering man to ground. Abdomen compressed inward and upward, deflating lungs. Release of compression, with gravity, induces inspiration.

*The figures from which the photographs shown on these pages were made were prepared under the direction of Dr. Hart Ellis Fisher, chief surgeon of the Public Service Co. of Northern Illinois. They were displayed at the Museum of Science and Industry in Chicago and photographed originally by Frank G. Korth of Chicago for the American Red Cross.

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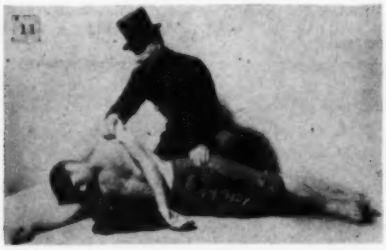
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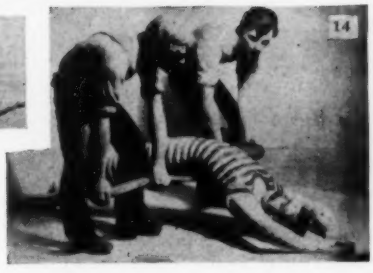
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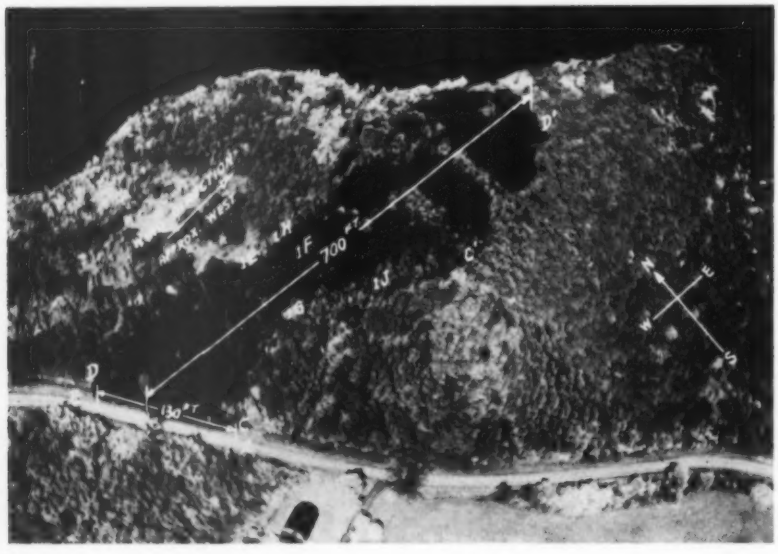
The Use of Wetting Agents in Forest Fire Suppression

By CLARENCE E. EDSON* and WILLIAM W. PARKER**

THE fire protection industry, in general, and the forest fire suppression agencies, in particular, have been greatly interested in recent developments concerning the use of wetting or surface active agents in the extinguishment and control of fires in solid combustibles. Forestry and fire department personnel in Rhode Island have been experimenting and using wetting agents in the extinguishment of actual forest and frame building fires for a period of over 18 months. It was felt that a detailed report of several typical forest fires in which a wetting agent was used for extinguishment and control would be of interest.

Volunteer fire departments in cooperation with State and Town forestry organizations in Rhode Island have extinguished over forty brush and forest fires in the last year and a half with wetting agent solutions. The three fires which will be reported were chosen because they are typical of the conditions encountered and the results obtained with wetting agents in this area.



Aerial View of Area Covered by Fire No. 1

Water has had an important place in the extinguishment of forest fires for three major reasons. Firstly, it is common material and is available practically anywhere without cost. Secondly, it has great heat absorption capacity, enabling it to rapidly cool burning solids below their ignition temperatures. Thirdly, and equally important, water is a liquid.

Fires occurring in solid combustibles are invariably in three dimensions and the extinguishing medium water can normally be directed to a single plane. It has been emphasized repeatedly that water to cool and extinguish burning materials must reach the seat of combustion. If water were not a liquid capable of flowing and spreading around fire configurations to reach the seat of combustion, it would be a comparatively inefficient extinguishing agent.

Another important function of water in practical fire fighting is its use to delay or prevent the ignition of combustibles. This function of water invariably is concurrent with actual extinguishment. For example, water used in extinguishing forest fires is partly applied to the burning material and partly applied to the unburned portion of the fire line. Water may also be utilized solely for this purpose for protecting exposures or for the establishment of a line from which to backfire. The same basic reasons outlined under extinguishment, namely, availability, cooling capacity and liquid characteristics also are valid when water is employed to delay or prevent ignition.

The importance of the liquid characteristics of water in forest fire fighting have been recognized. In both deciduous and coniferous areas where there are sizable amounts of ground litter, water has not proven to be effective in completely extinguishing a fire line. Water under these conditions will rarely completely saturate and penetrate through the ground litter to mineral

* Rhode Island Division of Forests & Parks.
** Fire Specialties Division, Arnold, Hoffman & Co., Inc.

soil. The basic reasons for this failure may be found by analysing the liquid and wetting properties of water. Therefore, standard operating procedures for forest fires, as outlined by the U. S. Forestry Service and other organizations, have been to remove the combustible materials and expose mineral soil by trenching. This procedure is both tedious and expensive. In many areas, because of personnel problems, it is virtually impossible to put this technique into practical use.

Fundamentally, wetting and surface active agents are employed to alter the liquid properties of water enabling it to more rapidly and efficiently flow around and penetrate into the combustible materials. Water so treated can also more readily flow around surfaces to protect exposures and more rapidly penetrate combustibles to prevent or delay their ignition. For example, a 1 per cent aqueous solution of a properly formulated wetting agent will penetrate cotton batting 300 times as fast as untreated water.

Water with Wetting Agent Boils More Rapidly

Recent work also indicates that water treated with a properly formulated wetting agent will more rapidly boil away from a surface. It follows that if water boils away more rapidly, it more rapidly cools the surface and, consequently, speeds extinguishment.

To summarize the general theory, properly formulated wetting agents are utilized to change the liquid characteristics of the extinguishing agent—water. Water so treated will more rapidly flow around fire configurations to reach the seat of combustion and will more rapidly boil away, speeding extinguishment. Water so treated will also be greatly more effective in penetrating and saturating combustible materials, such as ground litter, to delay or prevent their ignition.

Although the fundamental principles involved in the use of wetting agents in the fire protection industry are simple, practical problems involving equipment and techniques are numerous.

Although many surface active and wetting agents are commercially available, an efficient formulation for this industry should have the following characteristics: It should be readily soluble in water over a wide temperature range; it should form a water solution which has long term stability and efficiency; it should perform with all naturally occurring water supplies and such water may be acidic or alkaline or may contain high concentrations of inorganic salts; it should produce little change in nozzle or pump characteristics; it should be non-corrosive to the metals used in fire extinguishing equipment; it should incorporate a rust inhibitor if there is a tendency to accelerate the rate of rusting where premixed solutions are stored in ferrous tanks such as the booster tanks of fire trucks.

Another major problem which is being solved is the development of proper proportionating equipment in order that wetting agents may be introduced into line discharges when their use is desirable with economy and accuracy. Comparable equipment has been developed for the introduction of mechanical foams. Normally, mechanical foam is used at concentrations of 6 per cent by volume of water. Wetting agents are normally employed for fire extinguishment in concentrations ranging from ¼ of 1 per cent to 2 per cent by volume of water. The energy requirements for wetting agent proportionators are consequently of smaller magnitudes by comparison with mechanical foam. Therefore, pressure drops across efficiently designed proportionating equipment will be less.

Finally, proposed wetting agent formulations should be subjected to both laboratory fire test programs and field fire test programs under practical fire fighting conditions.

The first major investigations of the use of wetting agents for the extinguishment of solid combustibles and flammable liquids were conducted by the Factory Mutual Laboratories and by Arnold, Hoffman & Co. Incorporated. Fire tests were conducted by both organizations with properly formulated wetting agents in concentrations varying from ½ of 1 per cent to 2 per cent by volume. Some of these solutions extinguished burning cribs of two by fours three times faster than plain water. In other tests with kerosene extinguishment with water spray nozzles was effected in one-half the time and with one half the nozzle pressure required for plain water. Results, however, with more volatile liquids whose flash points were less than 100° F. were of insignificant practical value.

Concurrently, with cooperation from the fire department ond forestry personnel, Arnold, Hoffmann & Co. Incorporated initiated a major field testing program with a wetting agent formulation termed *Drench*. After a period of 18 months of field experiences with fires of most types, including frame building and forest fires, the general theory and laboratory results had been substantially validated. Other organizations are actively investigating this new field of fire protection and additional products will be available in the future.

Fire No. 1

Location—Northeast of the Spring Brook Road, Scituate, Rhode Island.

Photographic Reference—Aerial No. 1.

Date—May 12, 1947.

Time, Rhode Island Forest Fire Tower, Chopmist Hill reported smoke at 12:08 P.M.

Ground Wind Velocity — Approximately 3 miles per hour.

U. S. Weather Bureau Wind Velocity —12:00 noon, southwest—15 miles per hour; 2:00 P.M., southwest—24 miles per hour; 5 min. gusts maximum—30 miles per hour.

R. I. Forestry Classification—Class 4 Day.

Cause of Ignition—Unknown, fire originated at the roadside.

Companies responding—North Scituate Fire Department No. 1 and Hope Jackson Fire Dept.

Chief in Charge—John J. Crowley, North Scituate Fire Department.

Description of Area—Photographic references, Aerial No. 1. Ground photographs No. I-E, I-G, I-F, I-H, I-J. The area consists of a plantation of red and white pine on the water shed of the Scituate Reservoir which supplies the City of Providence. Trees in the main area are of an approximate age of 15 years—main area was of dense growth with branches of the trees extending to the ground. On the southeasterly side, there was a stand of pitch pine—40 to 50 years old—with some tree falls resulting from hurricane damage. There is a fairly heavy matting of pine needles beneath the trees illustrated by Photograph No. I-H. There are a few scattered patches of dead grass, as illustrated in the foreground of Photograph I-E.

Description of Fire—This was a fast burning fire in heavy pine growth with a tendency to crown from one pine tree to another, thus carrying the crown fire ahead of the ground fire. The North Scituate Fire Department located approximately 1 mile from the site of the fire. The alarm was prompt and the companies arrived at the fire within 5 minutes.

Referring to Aerial Photograph No. 1, the North Scituate truck No. 2 was stationed at B. From C to C', a

1" booster line with a 1" fog nozzle was used and approximately 100 p.s.i. nozzle pressure was maintained. The line from C to C^1 was approximately 400 feet in length. A ½ of 1 per cent solution of wetting agent was supplied from the 100-gallon capacity tank on truck No. 2. From D to D^1, a 1" booster line with a 1" fog nozzle was used. Nozzle pressure was maintained at approximately 100 p.s.i. This line was approximately 750 feet in length and, again, a ½ of 1 per cent solution of wetting agent was pumped from the 350-gallon tank of truck No. 3. From C^1 to D^1, knapsacks were employed.

The Knapsack crew was comprised of 10 men and ½ of 1 per cent solution of wetting agent was employed in the knapsacks. Within a half an hour the fire had been stopped and was under control. Approximately 425 gallons of water treated with wetting agent was pumped through the two booster lines from the two trucks. 50 gallons of ½ of 1 per cent solution of wetting agent was employed in knapsack work, making a total for control and extinguishment 475 gallons of ½ of 1 per cent solution of wetting agent.

Hope Jackson Fire Department arrived at approximately 12:30 and supplied additional plain water for rewetting the fire line on the southerly side of the fire. It was questionable whether the additional water supplied was necessary as extinguishment had been completed. The additional amount of plain water utilized on the southerly side of the fire was 400 gallons and the presence of previous applications of wetting agent solutions enabled the plain water to more readily penetrate the ground duff. At 1:00 P.M. the companies returned to their respective stations and no patrol was left on the site of the fire.

The remainder of the afternoon was a Class 4 Day and next day, May 13th, was another Class 4 Day. At 6:00 P.M. Ranger Edson made a complete patrol of the fire line and there was no evidence of fire and no trouble was experienced at any subsequent time.

Conclusion—Considering the factors of previous climatic conditions, the wind velocities, R. I. Forestry Classifications, the type of area as illustrated in Photographs I-E and I-G, this was a serious fire to control and completely extinguish.

Photograph I-F illustrates the severity of the burn which exposed mineral soil. Photograph I-G illustrates the effective stop employing a ½ of 1 per cent solution of wetting agent through booster lines in extremely thick growth on the downwind side of the fire. Photograph I-E illustrates the stop which was made employing the same equipment on the other side of the fire. Absolutely no trenching was employed on the fire line or around the stumps or falls as illustrated in I-J. The fire line is actually bounded by the fallen tree in Photograph I-J. The forest floor covering of heavy pine needles is illustrated in Photograph I-H.

The operating personnel of the fire are of the considered opinion that control and extinguishment could not have been accomplished without aid of a wetting agent in as brief a time with as small amount of water.

Fire No. 2

Location—South of the Danielson Pike, east of the East Road and north of the Brandy Brook Road in the Town of Scituate, Rhode Island.

Photographic Reference—Aerial II.

Date—May 13, 1947, Rhode Island Forest Fire Tower at Chopmist Hill reported smoke at 12:45 P.M.

Ground Wind Velocity—12:00 noon—0 miles per hour; 2:00 P.M.—3 miles per hour; 4:00 P.M.—2 miles per hour.

U. S. Weather Bureau Wind Velocity—12:00 noon, southeast—12 miles per hour; 2:00 P.M., southwest—17 miles per hour; 4:00 P.M., southwest—23 miles per hour; Gusts—5 min. maximum—26 miles per hour.

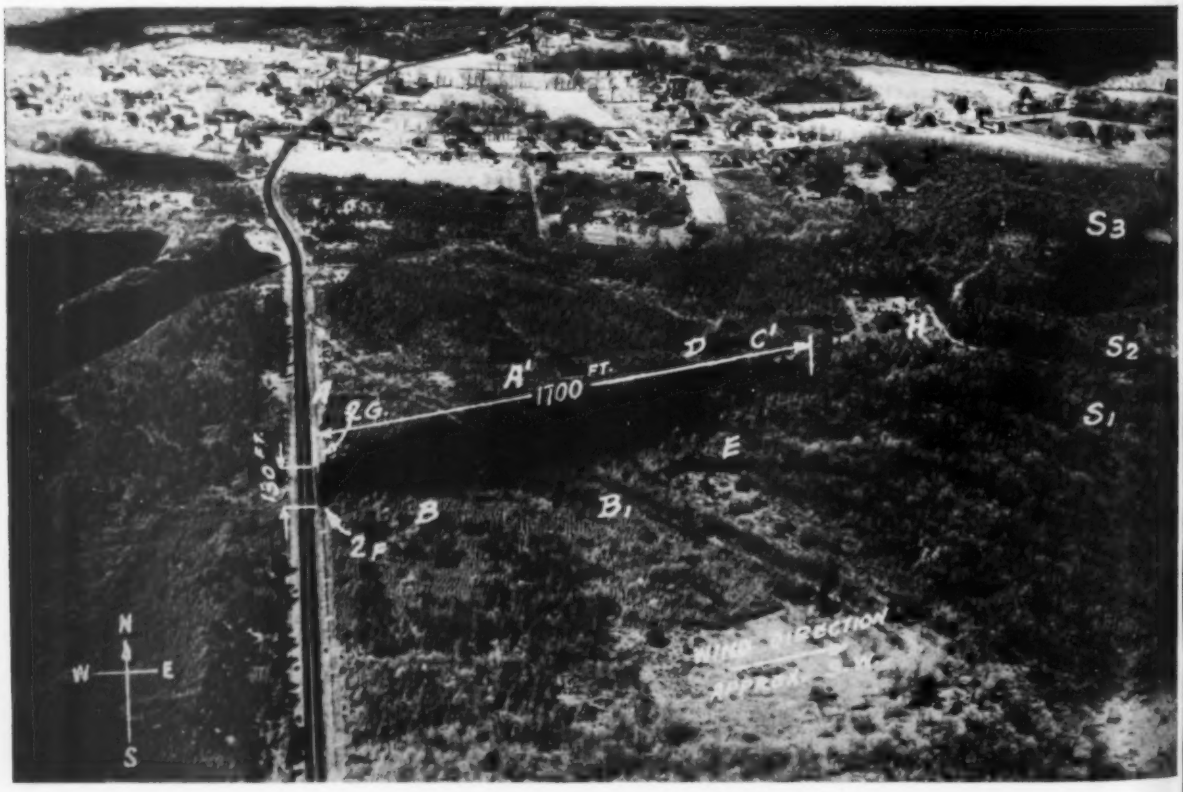
R. I. Forestry Classification—Class 4 Day.

Cause of Ignition—Unknown, fire originated at roadside.

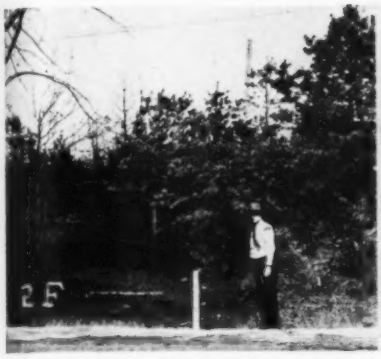
Companies Responding—North Scituate Fire Department with 3 trucks; Hope Jackson Fire Department with 1 truck; Greenville Fire Department with 1 truck; South Foster Fire Department rseponded but returned to own town to combat another fire and did not participate in this fire.

Chief in Charge—John J. Crowley, North Scituate Fire Department.

Description of Area — Photographic reference, Aerial Photograph No. II. The area consisted mainly of a plantation of red and white pine on the water shed of the Scituate reservoir. Trees were of average age of approximately 15 years with a scattering of 14-15 year old pitch pine. Part of the area was untrimmed with branches of trees extending to the ground and part of the area



Aerial View of Area Involved by Fire No. 2.



had been trimmed resulting in sizable piles of slash. A heavy matting of pine needles on the ground comparable to the conditions in Fire No. 1 as illustrated in Photograph I-H.

Photograph II-F was taken at the State Road on the south side of the fire, as indicated in Aerial Photograph No. II. II-G was taken from the State Road on the north side of the fire as indicated in Aerial Photograph No. II.

Description of Fire—The fire, in many ways, is similar and comparable to Fire No. 1 with the exception of slightly lower wind velocities. Here, again, there was a fast burning fire in the pine grove with a bad tendency to crown from one tree to another, the crown fire keeping ahead of the ground fire. The terrain was slightly uphill in the direction of the fire and embers were carried downwind and resulted in spot fires, S-1, S-2 and S-3, as illustrated in the Aerial Photograph II.

The North Scituate Fire Department, approximately ½ mile from the site of the fire, arrived within 5 minutes of receiving the report. Because of the variable wind and the danger of crown fires, the man in charge of Scituate Truck No. 3 parked approximately 300 feet from the fire on the State Road at A in Aerial Photograph II. A 1" booster line with a 1" fog nozzle at approximately 100 p.s.i. nozzle pressure employing a ½ of 1 per cent solution of wetting agent was utilized. Starting from the State Road in an unburned area and running parallel to the fire line, the nozzle man wet down both the trees and ground area from the road to A^1. He endeavored to go in as straight a line as possible. When the fire reached this line, it was stopped. This is illustrated by the straight line running from the road to A^1. Truck No. 3 was then relocated at approximately A^1 and worked on the fire line from A^1 to D^1 with same equipment and wetting agent solution.

Hope Jackson, upon arrival, was located at B^1. Two 1" booster lines were simultaneously employed and using ¼" straight stream tips and operated from B to B^1 and from B^1 to E. From B, westerly, to the State Road, knapsack crews were employed. Operations on this side were conducted with *plain water*.

Scituate Truck No. 1 and Greenville truck were located approximately at C and extinguished the head of the fire. Greenville Department utilized a 1" booster line, ¼" straight stream tip. Scituate Department No. 1 utilized a 1" booster line with a 1" fog nozzle, using a ½ of 1 per cent solution of wetting agent.

The main fire was under control at approximately 3:00 P.M. At this time, Greenville and Hope Jackson were reassigned on the road at approximately H to control and extinguish spot fires, S-1, S-2, and S-3. Large amounts of slash made these fires impossible to control with knapsack crews. The spot fires were brought under control with plain water, straight stream tips and booster lines.

Rewetting and mopping up operations on S-3 were done by water pumped from a brook through a 2½" line.

Scituate Truck No. 3 completed mop-up operations on the main fire. Chief Crowley reported on the line from the road through A^1 to D, a ½ of 1 per cent solution of wetting agent had been used and that there was *no mop-up or trenching necessary*. Along the line on the south side of the fire, from the road through B, B^1, and E where plain water had been used many spots required *rewetting and overhaul* to effect complete extinguishment.

Conclusion—This fire actually compared, under as accurate conditions as can be expected in the field, the extinguishing and penetrating efficiencies of water treated with a properly formulated wetting agent and untreated water. It is the opinion of Chief Crowley that at least twice the amount of fire line was extinguished per gallon of ½ of 1 per cent wetting agent solution as compared to plain water. Furthermore, the line which had been extinguished with the wetting agent did not re-ignite anywhere. The line extinguished with plain water re-ignited in several places necessitating rewetting and patrol. The operating personnel claim faster extinguishment is obtained by using a wetting agent and that complete penetration and saturation of ground duff is accomplished.

Fire No. 3

Location — Approximately ½ mile west of Coventry center and north of

Aerial View of Area Involved by Fire No. III

the railroad tracks, Coventry, Rhode Island.

Photographic Reference—Aerial No. III.

Time—R. I. Forest Fire Tower at Bowen Hill reported an unwarranted amount of smoke at 3:30 P.M. Aerial photograph No. IV taken at 3:15 P.M., illustrates the cause of ignition. A railroad section crew had burned off the right-of-way and had not completely extinguished one of their fires. The forest fire tower had been instructed to expect smoke from this area and did not report trouble until the amount of smoke did not correlate with the work being done. Companies arrived at approximately 3:40 P.M.

Wind Velocity—Ground wind—4 miles per hour at 2:00 P.M.; 4 miles per hour at 4:00 P.M.

U. S. Weather Bureau Wind Velocities—2:00 P.M., southwest—16 miles per hour; 4:00 P.M., southwest—14 miles per hour; Gusts, 5 min. maximum —25 miles per hour.

R. I. Forestry Classification—Class 4 Day.

Companies Responding—Hill Farm Fire Department with 2 trucks; Western Coventry Fire Department with 2 trucks and 1 jeep; Washington Fire Department with 1 converted command car.

Chief in Charge—Fire Warden J. R. Hill.

Description of Area — Photographic reference, Aerial Photograph III. The easterly portion of this fire occurred in a previous burned area—previous fire occurred in the spring of 1943. The westerly portion of the fire was in an unburned area. At the time of the fire, there was little or no foliage. When the photograph was taken 1 week later, the foliage had progressed. The easterly section consisted of standing dead oak with scrub brush and quantities of dead chestnut stumps. The westerly portion consisted of a live stand of oak with dead chestnut stumps, Section from F to F^1 was ledgey and the burn was not as severe along the west flank and the ledge.

Description of Fire—Upon arrival, the Hill Farm Fire Department located one truck at A. Knapsack crew of five men extinguished line from B to C. A 1" booster line, employing a spray applicator, as illustrated in Photograph 3-H, was used from D^1 to D. A nozzle pressure of approximately 50 lbs. was maintained, employing a ½ of 1 per cent solution of wetting agent. The rate of discharge was approximately 6.5 g.p.m. The Hill Farm truck remained at A but had insufficient booster lines to reach the railroad track. Booster line was taken from Washington's converted command car and supplied the Hill Farm truck with hose and water. This water was also treated with ½ of 1 per cent solution of wetting agent. After completing this operation, the Hill Farm truck was relocated as illustrated at B. The same 1" booster line nozzle employed previously was run from E^1 to E on the east side of the fire which is approximately 1600 feet—Washington's command car, Western Coventry truck and jeep supplying Hill Farm tank truck with water treated with ½ of 1 per cent of a wetting agent .

From the railroad track at E^1 to B was a slow burning duff and stump fire which took considerable time to extinguish due to burning into the ground duff. Therefore, after wetting and extinguishing fire line complete mop-up of burning snags and stumps was done for a distance of approximately 100 feet into the burned area. This took considerable time and consumed much more water than the operations on the fire line. A total of 2200 gallons of a ½ of 1 per cent solution was required to completely extinguish this fire. That included extinguishment and mop-up operations. The fire was declared out at approximately 10:00 P.M. and 2 men were left to patrol the area with two 5-gallon knapsack pumps. They left the fire at 1:00 A.M. and found no evidence at any time of any rekindle or break on the line.

At 9:00 A.M. the next day, Warden J. Richard Hill and a patrolman from the R. I. Fire Service made a complete patrol around this fire and found no evidence of any fire whatsoever. At approximately 1:00 P.M. the next day, the Forest Ranger for this district had the Forest Fire patrol plane patrol this area. The plane could find no smoke or evidence of any live fire.

General Conclusions

The results obtained by the use of a ½ of 1 per cent solution of a properly formulated wetting agent in the extinguishment of the three fires reported herewith substantiate not only the theoretical and laboratory data, but also the observed data from numerous other fires in this area.

Experienced Personnel, utilizing efficient operating techniques which include tank supplied of premixed solutions of wetting agents, booster lines and small spray or fog nozzles can more rapidly extinguish the fire line and secure complete penetration and saturation of ground litter. The latter function, if adequately performed, can eliminate trenching and result in substantial savings in man hours. Such savings of man hours and the complete extinguishment of forest fires in this area have more than offset the additional cost of the wetting agent employed. For example, Fire No. 3 in Coventry, R. I., where duff conditions were particularly hazardous, the operating personnel felt that without the use of a wetting agent, the eastern flank of the fire where the line was approximately 1600 feet in length, would have needed complete trenching to eliminate all possibility of rekindles. In this area, where there were many boulders and rotten stumps, the cost of trenching 1600 feet of fire line would have been substantial. The cost of the wetting agent employed on the entire area for extinguishing the fire and including 3500 feet of fire line was $27.50.

It should be strongly emphasized that the use of wetting agents in forest fire suppression is not a miraculous cure-all. To obtain economical and complete fire extinguishment, intelligent operating techniques must be employed. In areas which are not accessible with hose lines or where water supplies are not available hand tool techniques must still be employed.

Photographic Data

It was thought that photographic data would be of interest concerning the aerial and ground photographs which illustrate this report.

Aerial photograph No. I, II and IV were taken the afternoon of May 16th. Infra-red sheet film was employed. The basic exposure was f-4.5 at 1/100th of a second. Aerial photograph No. III was taken on May 23rd with same film

(*Continued on page 592*)

Aerial No. IV—View of Fire No. 3 in Its Early Stages

Department Operations Speeded By 2-Way FM Radiotelephone

Los Angeles, Calif., Fire Department Steps Up Efficiency by Use of Radio Communication Equipment

By FRED E. EBEL

THE 2-way FM radiotelephone communication system used by the Los Angeles Fire Department has greatly expedited fire-fighting operations in this 452-square-mile metropolis, where Man and Nature have conspired to confront 1,805,687 people with every known fire hazard.

For here, in a municipality 152 square miles larger than the City of New York,

Photo Courtesy Los Angeles County Chamber of Commerce

Acres of Petroleum Refining Equipment Abound in Los Angeles County. Here Is a Camera Shot of Richfield Refinery, a Plant Turning Out Millions of Gallons of 100 Proof High Octane Gasoline.

can be found 40 miles of wharves built on creosote piling, numerous fish docks with their attendant oil and inflammable liquids used in vitamin processing, petroleum refineries, crude oil tank farms, and vast manufacturing plants.

Sprawling community shopping centers add to this varied picture, as do the 130 square miles of mountainous brush country, where as many as sixty calls on the fire department are recorded on a dry summer's day.

Manifestly, in a city where it is possible for a motorist to drive 50 miles and still be within the city limits, coordination of the 83 engine companies is of the utmost importance. Coordination, which relies on speedy, reliable communications, is fully realized through the 2-way FM radio system, comprised of three 250-watt FM main stations and sixty 2-way FM mobile units mounted on engine, truck, rescue, fire boat, and administrative equipment.

The transmitter for the metropolitan area is in the earthquake-proof building of the Fire Alarm Bureau, located on the north side of MacArthur Park. From the Signal Office in this building, radio messages are dispatched via the radio remote control console which connects to the nearby transmitter, licensed under the call letters KCJD.

Servicing the southern section of the city, which includes the extensive harbor area, is the 250-watt FM station at San Pedro—KCJB. Technically similar to the MacArthur Park installation, it is remotely controlled from the signal office at Engine 36.

The third main station is situated in the foothills of the Santa Monica Mountains at Mountain Patrol No. 1. Here a 200-foot Wincharger tower adds to the natural high elevation, helps high frequency signals cover the rugged terrain. It is possible to dispatch directly from here; however, most of that activity is conducted by remote control from the Valley Signal Office at Engine 39 in Van Nuys, and also from the West Los Angeles Signal Office at Engine 59, using the call letters of KCUG.

A new station will soon be in operation at Reposa Point, elevation 750 feet, in Elysian Park. A 250-watt FM transmitter housed in a sturdy Quonset Hut, will make possible greater signal coverage over this section of Los Angeles. Provision has been made for emergency power in the form of a gas-electric unit which switches on the instant power fails.

Both fixed stations and mobile units operate on the common frequency of 35,580 kilocycles. This one-frequency operation effects a high degree of flexibility, inasmuch as all personnel in the effective listening area can hear *both* sides of the conversation, and thus be fully alerted should the dispatcher call for additional help.

One-frequency operation also enables Chief Engineer John H. Alderson and Deputy Chief Frank H. Rothermel to have possession of full information regarding all activities whether they are in their offices or in their radio-equipped cars.

"It's like having my office with me," says Chief Alderson in reference to his radio car. He adds: "2-way radiotelephone for the fire services is the greatest innovation since the first motor-driven vehicle replaced horse-drawn apparatus!"

Six thousand fires plagued Los Angeles last year, many of which, it is reasonable to assume, were lessened in severity due to the speedy intervention of 2-way radiotelephone.

The recent electro-plating plant explosion which shook the City of Los Angeles and which took the lives of

Photo Courtesy Los Angeles County Chamber of Commerce

Synthetic Rubber Industry in Los Angeles County Uses These High Pressure Spheres to Store Raw, Intermediate and Finished Butadiene. Butadiene in These Spheres Is Ready to Flow to Rubber Plants in Liquid Form.

Mountain Patrolman Radios "We Can Handle," as Men Put Finishing Touches to Brush Fire in Santa Monica Mountain Area. One Hundred Thirty Square Miles of Brush Country Are Serviced by Fifteen of These 600-Gallon Tank Trucks Equipped with 2-Way FM Motorola Radiotelephone.

18 persons and destroyed 116 buildings, is an excellent example of radio's usefulness in the fire services.

Only two minutes after receiving the first alarm at 9:47 A.M., the first chief officer radioed for all available ambulances, thus providing speedy medical attention for the injured.

At 9:50, one minute later, the chief radioed for two rescue companies, two truck companies, and arson investigators. At 9:56 another call flashed into headquarters, this time asking for four engine companies and four truck companies. From then on there was no letup on the radio system which was used in expediting rescue and over-all activity until 12:52 A.M. when the last company reported in.

Many tangible services were rendered by radio's assistance that tragic day. However, the "intangibles"—the "what might have happened had radio not been there"—are what many fire officials readily concede as the real advantages of 2-way radiotelephone.

Reference has been made of the sprawling communities of the City of Los Angeles. City ordinance, which prohibits the building of skyscrapers, has placed an additional burden on the fire department which must provide protection to the following Los Angeles communities: Hollywood, North Hollywood, West Los Angeles, Venice, Reseda, Van Nuys, Tarzana, Canoga Park, Sunland, Tujunga, San Pedro, and Wilmington.

Many of these communities present their own pecu iar fire hazards. For example, the harbor territory of San Pedro and Wilmington has extensive shipyards and 40 miles of wharves. A carelessly thrown lighted cigaret falling on the creosote piling of these wharves can cause the severest of harbor fires—an under-wharf fire. Such a conflagration can threaten the valuable tonnage of export commerce, reputed second only to New York. For entering and leaving the Los Angeles-Long Beach Harbor each year are 6,000 ships carrying around 18,000,000 tons of merchandise, valued at approximately $1,000,000,000.

Adding to the fire-protection responsibility in this waterfront area are the fish docks and large canneries. Oil fields, petroleum refineries, and crude-oil tank farms are also in the harbor vicinity, and though these industries have fire protection second to none, there are occasions when extra help is needed.

Three fire boats, each equipped with 2-way FM radiotelephone, provide waterfront protection. These "floating" engine companies are augmented by land companies, which, by means of radio, are able to direct the activities of the fire boat. Coordination of land and water forces is therefore as effective as a well-organized military campaign. For by simply pressing a button on a handset, both the fire boat captain and the land chief can inform each other of their fire fighting operations.

A firebrand can menace the safety of extensive and varied industries behind the harbor area. The refining of petroleum products, of course, ranks first with an annual value of two and one-quarter million dollars. But further behind this world's greatest man-made harbor, which is the home port of the Pacific Fleet, is the fabulous motion picture industry where 85 per cent of the world's pictures are made, resulting in a weekly payroll exceeding $1,500,000.

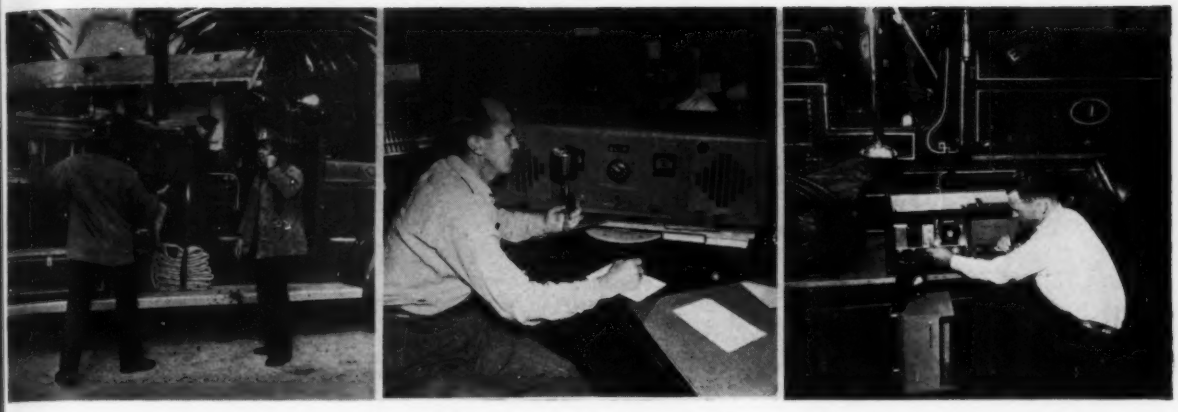
Demanding fire protection, too, are the great auto assembly, airplane, and tire manufacturing plants. Besides these high-output industries, Los Angeles has many diversified industries. For example, it holds fourth place in the manufacture of furniture and women's clothing.

Assisting in locating fires in this vast metropolis is a large colored map, almost occupying an entire wall of the Metropolitan Signal Office. By placing a plug in an adjoining index board, areas can be lighted on the map, representing one-half square miles of the location sought. If such a square light falls on an area where large concentration of values are involved, the dispatcher might send as many as four engine companies to the scene.

New Station at Reposa Point in Elysian Park, Elevation 750 Feet. Quonset Hut Houses 250-Watt FM Motorola Transmitter and Emergency Gas-Electric Power Unit.

Fire Boat No. 2 in Los Angeles Harbor. Forty Miles of Wharf Must Be Protected as Well as Oil Fields in Background. Pole in Foreground Supports High Frequency Antenna Connecting to 30-Watt FM Motorola 2-Way Radiotelephone.

Captain W. W. Johnston, Mountain Patrol No. 1, Shown in Vicinity of 200-Foot Tower Supporting Antenna for 250-Watt FM Transmitter Below. In Background, Santa Monica Mountains "Brush" Country.



Left: Los Angeles Fireman Radios Extent of Fire to Dispatcher. Coordination Made Possible by 2-Way Motorola FM Radiotelephone Unit Installed on Engine Makes for High Degree of Fire Fighting Efficiency. Center: Captain C. W. Howard Dispatching from Motorola Remote Control Console Built on Turntable to Permit Operating Flexibility. Console Connects to Nearby 250-Watt FM Motorola Transmitter in Same Building, Central Fire Alarm Bureau, MacArthur Park. Right: Kenneth T. Corner, Radio Technician, Los Angeles Fire Department, Tests Transmitter Portion of Compactly Installed 2-Way 30-Watt FM Motorola Radiotelephone.

Before the advent of 2-way radiotelephone, equipment was "lost" as soon as it left the station. Thus if the dispatcher received subsequent information that, for example, a false alarm had been pulled, or that the fire had been extinguished, obviating the necessity for additional equipment, he could not apprise personnel of this new information. The first company arriving on the scene had to sacrifice a man for the sole purpose of finding a telephone to notify the dispatcher of the extent of the fire. If it was small, this man had to "flag down" other engines en route, advise them that the nature of the fire did not require additional help.

Such unintentional prodigal use of men and equipment has been eliminated completely by the efficient 2-way FM radiotelephone communication system. Now by radio the dispatcher immediately informs companies of "blind" fires, thereby restoring them to emergency service in a matter of seconds.

This efficiency of recalling unneeded equipment while en route sometimes causes amusingly ironic results.

Chief Alderson tells of a citizen who brought the Department to task after noticing a fire engine in full career suddenly turn off its red lights and siren just as though it were "lost".

"The equipment wasn't lost," declares Chief Alderson. "What this well-meaning tapxayer didn't know was that the men had received radio instructions to turn back, and by doing so, actually were saving this man money!"

It is at once interesting and terrifying to speculate on how much money and that priceless commodity, life, are saved by the expediting of fire operations through 2-way radiotelephone. Exact measurement is difficult because of the intangible factors involved. For example, has one life or several hundred been saved because a chief could radio immediately the location of a menacing firebrand? Has a one hundred dollar loss or a hundred thousand dollar loss been prevented by the speedy arrival of equipment, called by 2-way radiotelephone?

Left to the imagination these questions produce awesome thoughts. For instance, a chief officer arriving at a major hotel fire sees at once that, to be effective, equipment must arrive by way of the alley. He presses a microphone button and transmits this information to on-coming companies *while the latter are still blocks away.* What price can be attached to this bit of information flashed at the speed of light, when a minute or even a second takes on tragic importance?

This same fire chief noticing the presence of a high dry wind could radio instantly for additional truck or engine companies, thus obtaining vitally needed equipment in the shortest possible time.

When it is realized that Los Angeles averages 37 days of rainfall per year (14.76 inches), it is apparent that during the dry season a spark on a shingle is all that is required to start a fire. So imminent are the potentialities of timber and brush fires during the summer time that the Mountain Patrol has police power to arrest anyone violating the "No Smoking" ruling in the 130-square-mile Santa Monica Mountain area. This ruling extends to people in cars found smoking in the restricted area.

Citizens in this "hot" area require permits before they can burn refuse in the open. A patrolman checks the area to determine the advisability of issuing such a permit. The men in the 8 patrol cars are assigned for this duty, as well as the job of enforcing other fire regulations. A house owner, for example, might have brush lying close to the incinerator. The patrolman, then, writes out a Recommendation Memorandum advising the citizen to remove the brush a certain number of feet from the incinerator. If the recommendation is ignored a Final Notice is issued. The violator is then subject to penalties if compliance to the ordinance is not received before a stated date.

One hundred miles of fire road and one hundred miles of fire break are maintained by the Fire Department in this northwest Los Angeles territory, wild enough in spots to harbor the coyote and mountain lion. Such a wild spot, for example, is the Temescal fire lookout station located at the western end of Mulholland Highway. Here it is possible, from an elevation of 2051 feet, to overlook canyons and rugged hills strongly reminiscent of the Old West.

Instrumental in helping locate fires in this area is a map in the Metropolitan Signal Office, so constructed by means of flexible "straight-edges" which can be unreeled from the various lookout station positions, that the almost exact site of the fire can be determined.

Temescal, for example, might report: "See smoke at 50." The operator pulls the cord at the Temescal position, sticks its pointed end on the map number 50. Now Griffith Park lookout reports: "Smoke at 290," while the lookout at Pat Mountain reports: "140." The corresponding lookout cords are unreeled and pinned on top of their respective numbers, i.e., 290 and 140. The intersection of all three cords marks the location of the fire.

Because of their remote operations fire fighters in the Mountain Patrol would feel lost without their radio communication system. Fifty to sixty fires in the summer-time and approximately twenty in the winter-time are fought daily with the aid of 2-way FM radio mobile units installed on fifteen 600-gallon tank wagons and other mobile equipment.

Here, where an extensive brush fire can out-run a man, jump from one ridge to another, a communication system faster than fire's own remarkable rate of growth is of the utmost importance.

An example of radio's role in fighting these mountain fires is afforded by a recent conflagration in which twenty acres of canyon were involved. Seeking a point of vantage from which he could coordinate firefighting operations, the division chief of the northwest area parked his car on a high hill in the Santa Monica Mountains. The panorama view that spread before his eyes enabled him to give a "blow-by-blow" press-box account of the activities transpiring many feet below. And as the need for more apparatus became necessary, he radioed in additional alarms, giving explicit road directions to the responding equipment. Some companies, for instance, were directed to come into the canyon from the opposite direction.

One hundred per cent coordination made possible by that most flexible of communication tools, 2-way radiotelephone, made it possible to speedily position equipment to best advantage. If radio had not been on the scene

during this fire it is altogether conceivable that many more acres might have been destroyed.

The dispatching system is a model of simplicity. Messages are kept as brief as possible. For example, a mobile unit will radio: "Engine 82 to Westlake, at 1942 Beachwood Drive. Food on stove. We can handle. KCJE." To which Westlake (the Metropolitan Signal Office at MacArthur Park) replies: "Westlake to Engine 82, Roger. KCJD."

Now Westlake transmits a tone signal alerting all units, thus: "Westlake to all units responding to 1942 Beachwood Drive. Engine 82 reports food on stove. They can handle. All companies return to quarters. KCJD." The mobile units identify themselves, "Roger" acknowledgement and return to emergency service.

Mobile units are all licensed under the call letters KCJE. Except in cars used by administrative personnel, a handset rather than a loudspeaker becomes the listening device. Thus with the receiver directly next to the ear, interference from sirens and engines is reduced to a minimum. The operator merely presses a button on the handset when he wishes to speak, and releases it when he wants to hear the dispatcher "talk back."

FM, or frequency modulation, permits a high degree of clarity and freedom from man-made static. Man-made static, generated by Los Angeles' 2,000,000 vehicles in daily use, is greatly minimized by the use of frequency modulation. FM also minimizes electrical interference arising from buildings, factories, power lines, and electrical transportation systems.

Perhaps the most dramatic quality of FM is its immunity to lightning storms. Amplitude-modulated equipment is virtually paralyzed by this Nature-made electrical interference.

Mention must be made of the six strategically located radio-equipped rescue squad cars which perform daily high service to the citizens of Los Angeles. 4300 persons were treated during the last five years. 882 of the cases (chiefly resuscitation) were newborn babies. 55 per cent of the people served by these rescue squads are alive and well today.

Many of these people very likely owe their well-being to the speedy arrival of men and equipment, made possible by rapid communication. Fire fighters, too, have reason to be grateful toward these mercy squads, as witness the radio request: "Fire Boat 2 to San Pedro. Send rescue Company to Pier 232. Two men overcome by fumes. KCJE," and the speedy response: "San Pedro to Fire Boat 2. Roger. KCJE."

"Roger" is radio shorthand for "okay." The Los Angeles Fire Department thinks their 2-way FM radiotelephone system is more than okay.

They would feel lost without it.

(EDITOR'S NOTE: *The equipment used in the installation described in this article is manufactured by Motorola, Inc., Chicago, Illinois.*)

Oklahoma A. & M. Fire Protection Course

The Fire Protection Course offered by the Oklahoma Agriculture and Mechanical College, Division of Engineering, School of Technical Training, requires two years for completion.

The course was developed to afford specialized training in:

1. Detecting and eliminating fire hazards and causes through periodic inspections, remedial advice and systematic follow-up.
2. Conducting year around fire prevention programs.
3. Determining amount, type, and location of fire protection equipment for adequate protection.
4. Installing, testing, adjusting and maintaining fire protection equipment.
5. Applying modern methods of industrial and municipal fire fighting.

The Fire Protection curriculum is organized to supplement directly and indirectly related academic and technical subjects with actual practice. After one semester of training, students respond to fires during their off-class hours for actual experience in fire fighting, through the cooperation of the Stillwater Fire Department. Inspection trips to suitable industries and to large city fire departments are also made for study and research purposes to quality graduates for positions in the fields of insurance inspection, rating bureaus, fire protection equipment representatives and industrial and municipal fire protection.

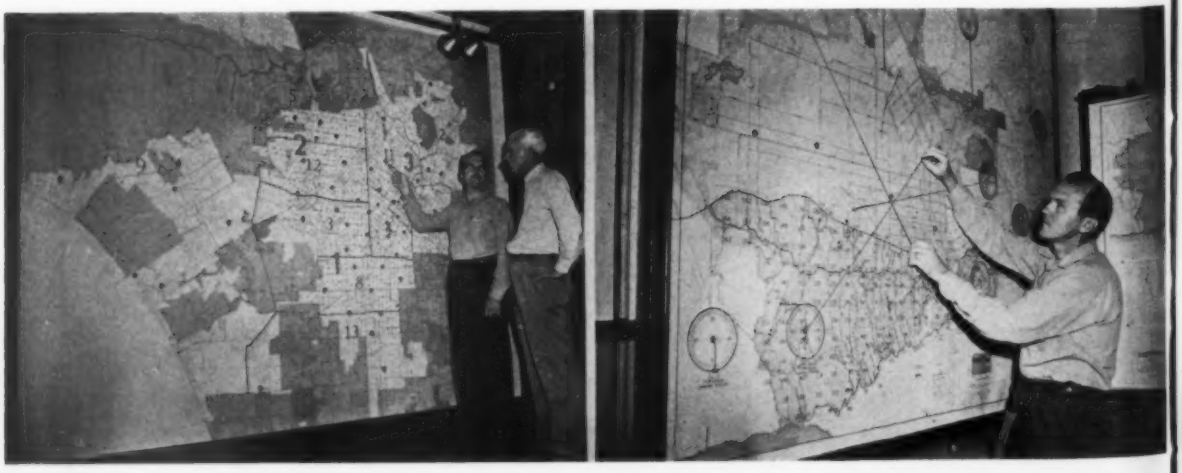
Complete information on the Course, with breakdown of the Program covering the four semesters may be had from R. A. Douglas, Supervisor of Fire Protection Training, School of Technical Training, Oklahoma A. & M., Stillwater, Okla.

Marshal Controls Hotels

Under new rules and regulations issued by the State Fire Marshal's office effective November 1, 1947, Indiana's hotels will be controlled by the Fire Marshal, former fire chief Carter Bowser of Ft. Wayne.

The new regulations affecting some 330 hotels were issued as the result of legislation passed by the 1947 General Assembly. According to Marshal Bowser, compliance with the code would "give reasonable assurance against loss of life or property from fire." The code was announced in July, to give operators time to make necessary corrections for compliance.

Principal provisions of the code include: enclosed interior stairways; enclosure of elevator shafts in one-hour fire resistant material; connection of hotel fire alarm systems with city systems; prohibition of the use of turpentine and confetti; requirement that bunting and streamers be flameproofed; requirement that an employe charged with immediate notification to fire departments of fires be on duty 24 hours daily, and changing of exit lights from red to green by July 1, 1949.



Left: Captain C. W. Howard Points to Battalion District No. 11 on Map as W. A. Randall, Battalion Chief in Charge of Central Fire Alarm Bureau in MacArthur Park Looks On. Different Colored Tags Indicate Engine, Truck and Rescue Companies. A Plug Placed into an Adjoining Index Board Lights up Representative ½-Square Mile Areas on the Map Facilitating Location of Fire. Map Includes Metropolitan Area, West Los Angeles, Venice and Mountain Patrol District. Right: Captain Howard Demonstrates Use of Map in Getting a "Fix" on Fires in 130-Square-Mile Mountainous Brush Territory in Los Angeles. Numbers Representing Geographic Locations ("Smoke at 117") Are Dispatched from the Various Fire Lookout Stations to the Metropolitan Signal Office in MacArthur Park. Where the Lines Intersect Determines the Fire Location.

LANSING DEPARTMENT REPORTS ON USE OF HIGH PRESSURE FOG

Find It Effective in Initial Attacks on Fires; Some Novel Uses Indicated

By Chief H. F. Fisher

Lansing, Mich., Fire Department

FROM the date our high pressure fog fire fighter (Squad No. 1) was placed in service, October 24, 1946, to May 31, 1947, it has responded to 427 alarms; average time in service on all alarms was 25 minutes; and at fires where losses occurred, 35 per cent of the fires were extinguished without the aid of regular pumping engines (this is not counting the smaller fires that were stopped so quickly that no loss was recorded).

No doubt we could extinguish the greatest percentage of our fires using high pressure alone, but the majority of our boxes now call for the Squad, 1 regular pumping engine, and one 65-ft. hydraulic ladder service truck. If there appears to be the slightest chance that water will be needed, the engine crew also lay a line and prepare to go to work, even though the fire is usually extinguished before they are needed.

We can readily understand how some cities will place their first piece of high pressure apparatus in service and after using it at a few fires, turn out lengthy reports using such words as "incredible", "unbelievable", "miraculous" and other 4-syllable adjectives. This is all true enough, and we did the same thing when we first started using high pressure and fog nozzles in 1940, but we feel that our new Squad, while being an excellent piece of equipment, has not caused any sensational changes in the methods which we have employed for the past seven years and has only been the means of increasing our efficiency along the same lines.

The Lansing Fire Department is in a rather unusual position regarding high pressure because the Bean fire fighters are manufactured here. During the past seven years, we have had the opportunity to watch the development of this type of apparatus, and in turn, our experiences have been of great value to the John Bean Mfg. Co.

Arrangements were made by the company officials with our city officials for members of their research department to stay at the fire stations for weeks at a time (1941 and 1942) and ride the apparatus to the fires. Because we were consistently making spectacular "stops" with increased safety for our men, we had no objection to being the "guinea pig" in such studies.

We purchased our first high pressure pump and fog-gun from Bean in July, 1940, and installed it on a Seagrave ladder truck instead of the booster pump. In July, 1943, we purchased a new 65-ft. hydraulic ladder-service truck from Seagrave and specified that it be engineered so that a high-pressure pump could be installed as soon as it reached Lansing and before it was placed in service. This worked out so well we called for an encore, and placed another one of the same in service January, 1947. In the meantime we received delivery of the Squad in October, 1946, and placed the oldest of the ladder trucks in reserve. This gives us four pieces of apparatus equipped with high pressure, three of which are practically new and in regular service.

Squad No. 1 is equipped with two-way radio, portable lighting plant and 2 flood lights, inhalator and other items totaling about 75 pieces of equipment.

Some of the features which make our Squad and our other high pressure equipment effective are:

Speed with which we can begin operations. Fog nozzles and hose reels are conveniently placed on either side of the apparatus and water is available immediately.

Whenever possible, we open up the other end of the building or opposite side, and the fog will drive the heat and smoke out, enabling our men to quickly reach the base of the fire.

Requires only one man to handle the nozzle and it can be used on any part of a building, from the basement to the roof, and on any type of fire.

Nozzle can be changed instantaneously from full fog to straight stream or any variation in between and will stay in the position desired.

When the fire is out, and if water is available from regular pumping engines, we fill the tank right at the scene of the fire and report in service by radio to the dispatcher so that the apparatus is available to send to another fire even while on the way back to the station. Lengths of 2½" hard and soft suctions are also carried so the tank can be filled at any water hydrant; also we can pump from any hydrant or cistern, lake, or any other source of water supply.

We have also found on fires in large vents above cooking stoves in restaurants or hotels that the natural draft of the vent will carry the fog clear up through the vent to the roof and extinguish the burning grease the full length of the vent.

On occasions where the fire is extremely hot, it works very effectively for the men with the second line to play their fog on the fellows first in, which gives a considerable amount of protection.

We have an instructor who devotes full time to a year-around program of training all men and the performance turned in, even by some of our younger fellows still on probation, indicates that it pays dividends, and that we are on the right track by devoting all spare time to study and practice.

Squad No. 1, High Pressure Fog Unit, in Service at Lansing, Mich.

Extinguishers Charged with Inflammables

Fire prevention officials of Minneapolis, Minn., are considerably puzzled over some war surplus fire extinguishers that have been disposed of here and which tests show contain inflammable liquid. Some of them have been seized and subjected to tests by Arthur Spottswood, chief of the fire prevention bureau. The contents proved to be better fire stimulators than extinguishers.

The investigation started after two airplane pilots purchased an extinguisher at a war surplus store. They discovered it contained inflammable lacquer finish and immediately reported the matter to the fire department. About 70 of the extinguishers at the store were seized by the officials and given a test. Fire Chief George S. Lockhart is convinced the investigation should continue to find out who was responsible for using such filler material in the extinguishers.

N. Y. Legion Will Entertain

The New York Fire Department Post No. 930 will entertain at Lincoln Square Center, 66th Street and Columbus Avenue, Manhattan, during the National Convention of the American Legion at New York City, according to a statement by Commander, Chief Warren S. Barton.

JUVENILE FIRE SETTER CAUGHT BY WATERLOO FIRE DEPARTMENT

Starts Four Large Fires in That City Before Being Apprehended

By Chief Ray Tiller

ON October 3, 1946, at 12:31 P.M., the Fire Department received a telephone alarm to 729-31 Commercial St., a building of ordinary construction 40x80′ three stories high and 40x40′ two-story at rear. Rear two-story part of this building was occupied by the Central Fibre Products Co. and used for the storage of egg case fillers. The first and second floors of the three-story part were used for the storage of second-hand automobile parts by the owners of the building, Morris and Dave Feldman. Value of building, due to age, was only $16,364.30. Insurance carried was $9,000, and loss on building, $12,000. In the Central Fibre Products Co., the value of egg case fillers was $4,455.25, insurance was $20,000, and loss was $3,888.55.

The alarm was received October 8, 1946, 10:59 A.M., by telephone, 708 Lafayette St., D. W. Sprow frame furniture warehouse. Value of building $7,000; insurance, $7,000; loss on building, $1001.50. Value of furniture stored on second floor was $5,000; insurance, $2,500; loss $2,500. Anderson Plumbing and Heating Co., occupant, part of first floor; value, $6,500; insurance, $5,300; loss, $154.53. C. W. Nauman doing business as Conns Place, occupant of part of first floor, second-hand store; value of contents, $3,500; insurance, $2,500; loss, $68.32. Size of building 40x100′ approximately.

October 8, 1946, 12:29 P.M., alarm received by fire alarm box, 823 Mulberry St., two-story cement block building with basement, approximately 40x120′. Owner of building, Iowa Warehouse Company. Value of building, $47,705; insurance, $44,800; loss, $41,799.44. The occupants of this building consisted of the Iowa Warehouse Co., several trucking companies which used this warehouse as a terminal, along with a large number of others who had goods stored in the building. Total value, $98,182; insurance, $97,718; total loss, $79.734; insurance loss, $72,220.

October 29, 1946, 6:40 P.M., 1019 Commercial St., alarm received by telephone from Herrick Refrigerator Co. Value of plant and equipment, $350,000; insurance, $290,000. The fire occurred in a metal-clad two-story lumber storage shed approximately 50x100′. Loss, $48,135, covered by insurance.

Immediately following the Iowa Warehouse fire I started an investigation of the cause of the Feldman, Sprow and Warehouse fires, in company with Deputy State Fire Marshal A. Lubberden. Little was accomplished until the night of the Herrick Refrigerator fire. A Richard Hall, 15 years of age, told a fireman that he could have put the Herrick Refrigerator fire out if an old man who was at the fence would have let him go into the plant. This was told to the fireman while fighting the fire. This fireman reported this information to the Chief of the Department. Mr. Lubberden who was present was notified immediately and he in turn, with a city detective, located Richard Hall that night and talked with him. He told the same story to them.

Later, the boys in that neighborhood were all questioned, along with several children at school, and Hall was brought in a second time for questioning, at which time it was discovered that he had been running with a boy by the name of Eugene Fike, age 14 years. Fike and Hall were both brought in to the Fire Chief's office at 8:00 A.M., November 6th. Fike finally broke down and stated that he was with Hall and they made a trip to Cedar Falls, which is approximately seven miles from Waterloo, on October 9th, where both boys entered an old mill which was used for the storage of a few tractor tires and bags of insulation. While looking through this building, Hall lighted a match and threw it on the paper bags of insulation. They then went out of the building and walked around for a short time and watched the fire until after the fire department had been called; then went to a picture show. Later that evening they took a bus and went to Fort Dodge, Iowa, and stayed all night, and the next day went to Des Moines, where they stayed two nights and returned to Waterloo, staying one night in a hotel before going home. Fike's story was that Hall furnished the money for the trip. With this information, the Deputy State Fire Marshal, Captain McKinney of the local Fire Department and Fred L. Beddard, connected with the National Board of Fire Underwriters, who came out to assist with the investigation about November 4th, were able to break Hall down.

Hall stated that on October 3rd, the day of the Feldman fire, he was alone and came up the alley at the rear of the Feldman building at about noon, entered the building through an open door and used only a match, setting fire to the paper wrappings on the egg case fillers. The reasons this fire gained so much headway were that the fire was started on the first floor of the building, there was an open stairway over the egg case fillers, and the paper on the fillers had been treated with paraffin. After being set afire they burned very rapidly, the fire burning up through the open stairway onto the second floor and burning forward through an opening into the three-story part of the building and up an open elevator shaft onto the third floor. There was no one in the building and, due to its size, the fire gained a great deal of headway before it was discovered from the outside.

On October 8th Hall was alone, going through an alley at the rear of the Sprow Furniture Warehouse, where a door was open leading to the second floor. He entered this door and went up on the second floor. There was no one on the second floor at that time and he set this fire to paper coverings on mattresses which were stored very near the center of the furniture warehouse.

One and one-half hours later the same day, or at about noon, Hall entered the Iowa Warehouse. The warehouse men had been unloading furniture from the railroad box car and the building was left open. However, there were two men in a truck terminal office and three men in the Iowa Warehouse Company office. Hall set this fire on the first floor about fifty feet from an open elevator shaft, using only a match to set a fire to paper cartons full of soap as well as some of the wrappings on the furniture. This fire, of course, burned over the ceiling, up through the open elevator shaft, onto the second floor, and gained great headway before it was discovered from the outside. A box was pulled about one block from the warehouse. Twenty-one minutes after this box alarm was received at Fire Headquarters, a large portion of the wall of the building fell.

Hall stated that he took about one gallon of kerosene and entered the Herrick Refrigerator Company yards by going over the fence at the lower part of the yard, which is located on West 10th St. The main plant runs from 10th to 8th Street. He entered the two-story lumber shed, poured kerosene on a lumber pile about the center of the shed and set it afire. He then went back the same way he came in and went through an alley to West 11th Street where a filling station is located and talked with a Richard Mercurio, a boy about 16 years of age, who was working at the filling station while the owner was at supper. Upon the owner returning to the filling station, Hall asked the Mercurio boy to walk up the alley with him to 10th Street to call two girls, one living on each side of the alley. The Mercurio boy went home and the Hall boy stood on the corner of the alley at 10th Street, talking with the two girls, until the fire was discovered in the lumber yard by a man living about 100 feet from where they were standing. That man ran out of his front door and across the street to the Herrick Factory fence, then called back to his wife to call the fire department as the building was on fire. Hall then left the girls and ran over to the fence and climbed over, and that was the time the man called to him to come out. He came back a short time later and told the girls that he could have saved the trucks that were stored in the lumber shed if the keys had been left in them.

Set Fires for Something to Do

Hall stated that he did not know why he set the fires, other than to have something to do. In checking we found that his mother and father both worked in a factory during the day and he was in the tenth grade in school, but had quit school about two weeks before he started to set fires. His folks were notified by mail that Richard had quit school but he got the letter out of the mail box and they didn't receive it. Both boys were brought to trial before the Municipal Juvenile Court and were committed to the State Training School at Eldora, Iowa, until they are twenty-one years of age.

The facts are that if Richard Hall had not made the statement to the fireman and had not talked to the girls, I

do not believe that we would have been able to break him down. Richard apparently is a very bright young boy but, in my opinion, the cause was due to the fact that he did not have proper home supervision. He was left at home alone all day and had to get up and get his own breakfast and go to school. He had worked some during the summer for the Western Union Telegraph Company and has purchased Postal Savings Bonds. He cashed these bonds to get the money to go to Cedar Falls, Fort Dodge and Des Moines.

Massachuetts Expands Forest Fire Radio Network

By Joseph L. Peabody, State Fire Warden

The Department of Conservation of the Commonwealth of Massachusetts has recently added a number of radio units to its forest fire radio protective network. A 250-watt central station has been installed in the Boston office of the Department of Conservation and twenty fixed stations of 30-watts output and eleven mobile units, have been installed in other parts of the state.

The "Har-Cam" 250-Watt Central Station Located at Boston Office of the Chief Fire Warden, Massachusetts Department of Conservation

The first radio network used by the Department consisted of composite type units built by the Department's radio division in 1935. Two-way communication on more or less experimental basis was set up between Plymouth and Falmouth. The system was expanded slowly as additional composite units were construction, the network being enlarged to include Brimfield and Petersham in the middle of the state.

The system of composite-type units was used until 1944-1945 when a complete change over to FM equipment was made in Barnstable and Plymouth Counties on assigned frequency of 31.34 mc. This first FM installation was composed of sixty-nine units operating in sections of eastern Massachusetts in such strategic points as Mount Wachusett, the Blue Hills, Middleboro, and the Falmouth area. The new FM system was such a great improvement over the previous radio installation that another contract for additional units has been awarded. This contract included the 250-watt central station for the Boston office and other above-mentioned units.

With these recently acquired units, the Department now has two-way radio communication between the Boston office and the nine district fire wardens and fifty-one observation towers throughout Massachusetts during every "fire" day. In addition there are thirty fixed stations and eighteen mobile units operated, most of which are used to maintain communication with cars of the officials of the Department and the district fire wardens. The towns of the Commonwealth, moreover, operate thirty-five fixed stations of their own and ninety-five mobile units on the same frequency as that used by the State Department of Conservation. This system allows communication between forest fire towers and cars over most of eastern Massachusetts and a large part of western Massachusetts.

There are still approximately 150 towns in the Commonwealth which may be classified as communities able to support a two-way radio communication system. In the next few years, it is hoped that these towns, in addition to others in Massachusetts, will be able to install two-way radio to expand even further the Department's state-wide forest fire radio protective network. At the same time, the Department hopes to enlarge its own system with more radio-equipped cars and fixed stations and a system of walkie-talkie units for communication at the scene of a forest fire.

Note: Equipment used in this installation is of "Har-Cam" make (Harvey Radio Laboratories, Cambridge, Mass.)

Baltimore Six-Alarm Blaze

A spectacular six-alarm blaze destroyed the interior of the Belford Furniture Manufacturing Company, West Pratt Street, Baltimore, driving out 120 workers, snarling traffic and attracting thousands of spectators. At one time the drifting heavy smoke seeped into the University General Hospital, causing officials to press all doctors, nurses and attendants to close windows and quiet patients. Employees of other business houses in the block also were evacuated.

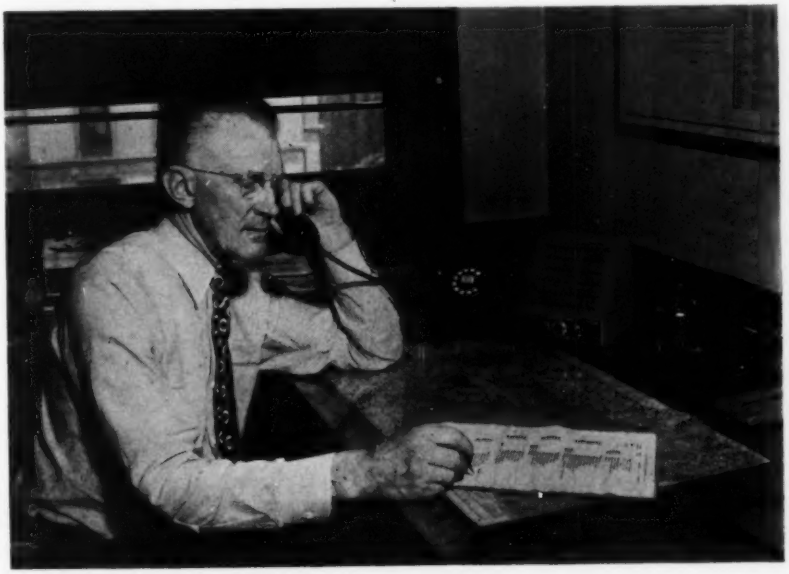
The Belford Building, a four-story brick and masonry structure, 50 ft. wide and 200 ft. deep was occupied as a furniture manufacturing plant with the exception of one floor which was used by the B. V. D. Underwear Manufacturing Company.

The fire, cause unknown, was discovered by William Scott, a paint-sprayer in the factory, who, while outside a paint spray booth on the third floor, noticed flames coming from the floor outside the booth. He shouted warnings to workers and fled. The fire department received the alarm from the box at Portland and Penn shortly after 1:30 P.M., and the second and third alarms were sounded immediately upon arrival of the first assignment. Fire Chief Howard Travers, rolling on the third alarm, transmitted the sixth as the seriousness of the situation became apparent. This brought a total of thirty pieces of apparatus and a heavy concentration of fire fighters.

The blaze, reported accompanied by blasts, some of which may have been due to at least a half dozen drums of highly flammable lacquer, spread quickly through the building, feeding also on the furniture pieces, to involve the entire structure.

Efforts to fight the fire from inside the structure early had to be abandoned and the department resorted to the use of heavy streams directed into the building from all available approaches. Streams were operated from ladders, and Capt. Elmer Kesting of Ladder 2, one of the first units to arrive, reported a blast was heard as his men mounted ladders to get water on the fire.

Three firemen were injured: Eugene Knapp, Ladder 2, lacerations; John Clopsin, Ladder 6, and Gerald Thomas, Engine 6 both of whom received foreign matter in the eyes.



Chief Fire Warden Joseph L. Peabody Using Desk Remote Unit Which Operates the "Har-Cam" 250-Watt Central Station

The fire was reported under control at 2:25 P.M.

When the sixth alarm was sounded members of the Board of Fire Commissioners, meeting at their headquarters, immediately adjourned and three of them sped to the blaze.

Police were hard-pressed to handle the army of curious spectators, many of whom left their cars on the highways to interfere with traffic and hinder efforts of the firemen. (Thanks to A. Hardy).

Fire Menaces Marietta

The business section of Marietta, Ohio, was threatened by a furious Saturday night fire early this year, that destroyed the L. Gruber & Sons Department Store at 155-57 Front street and badly damaged the adjoining Colonial block with loss of $250,000.

The century-year-old three-story Gruber store which had suffered two previous fires during the firm's 41-years, was located at the corner of Front and Munroe streets. It was of old-type brick joist construction as was the adjoining Colonial Building, erected in 1895, occupied as a combined business and apartment block. The latter contained an automobile sales agency and repair shop on the ground floor.

The fire, of undetermined origin, apparently started near the middle of the first floor storeroom of the Gruber Building where was located an office and stairway to the upper floors. A Patrolman on his rounds observed smoke rolling from the store, and telephoned an alarm. But by the time the men of Station 1, in command of Assistant Chief Roy Davis, arrived flames were shooting from the store windows. Before the apparatus from West Side Station 2 reached the scene, fire was seen coming through the roof.

Efforts of first arriving firemen to fight the blaze from Front street were futile and the apparatus had to be hurriedly moved. No apparatus could pass the furnace on the Monroe street side.

The available force of six regular firemen, aided by volunteers, two of whom were experienced men, one on leave as a result of injuries received at a fire in his community, and the other a retired city fireman, were insufficient to cope with spreading fire, and help was immediately asked of neighboring Williamstown and Belpre. The latter sent a pumper and fourteen men while Williamstown sent equipment and men.

When the Gruber Department Store Fire at Marietta, Ohio, Was at Its Height

At the height of the battle some sixteen hose lines were in operation, but shortly before 1:00 A.M. fire had worked into roof of the Colonial Building and threatened the entire structure. Electric light wires, parted by the flames, fell to the street, endangering firemen.

Fire Chief D. E. Drennen, who was off duty at the time of the fire but soon arrived and took charge, credits the 30-foot driveway below the Colonial Building and narrow Monroe Street, together with the absence of wind with retarding the spread of the blaze. In the Colonial Building the fire worked down into the rear of the third floor where firemen held it, although the lower floors suffered heavy water damage.

Nine persons occupying apartments on the upper floors of the Colonial Building were routed from their beds and removed by police, but no one was injured. Police also handled the large crowd of spectators.

The water supply was reported as adequate, about 130,000 gallons being used from the reservoir. Firemen were supplied with coffee and food throughout the night battle by the Salvation Army and local merchants. The Red Cross assisted in finding quarters for the homeless.

The fire continued to smoulder for two days, firemen being called twice on Sunday to extinguish re-kindles and again on Monday when a good size blaze developed in the basement. The walls were finally pulled down by order of Chief Drennen.

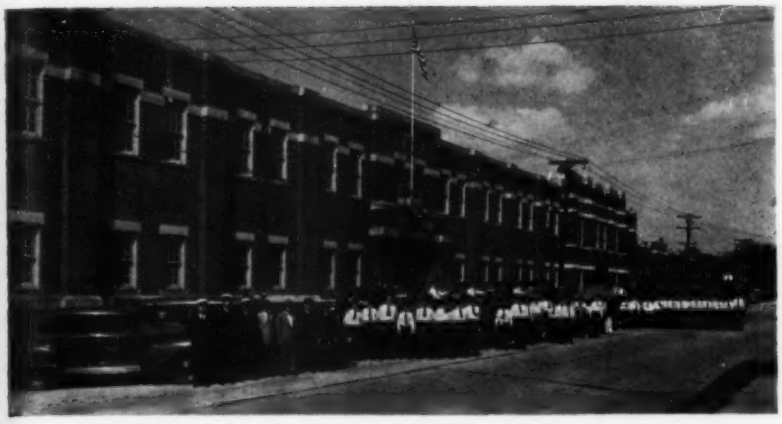
The threatened conflagration — the worst to hit the city in years—is reported to have demonstrated the department's lack of manpower and equipment. Of the 5,500 feet of hose used in fighting the fire, approximately 4,300 was operated by the local fire force, which was unable to bring an additional 1,000 feet into play because of lack of personnel.

Ladder Pipe, First Used to Check Outside Extension of Fire to Upper Floors, Is Used on Ground Floor Blaze in Gruber Store at Marietta, Ohio

New County Fire School

The Board of Supervisors of Saratoga County, N. Y., have voted to establish a County Fire Training School for volunteer firemen, and have named Fire Chief Howard Humes of the Ballston Spa Fire Department as director. The School will be continued through December 31, next. Chief Humes is also president of the Saratoga County Fire Chiefs Association.

Schools will be carried on in six sections or groups, each including fire departments of several communities and each group having a chairman to aid in directing its activities.



Red Bank, N. J., Volunteer Fire Department and Its Apparatus Lined Up for Inspection

Seventy-Fifth Anniversary for Red Bank Firemen

The Red Bank Volunteer Fire Department will celebrate its seventy-fifth anniversary on September 11-13, 1947.

It is the plan of the department to make the celebration almost state-wide. There will be contests in pumping, hose laying, and ladder raising, as well as a large exhibit of fire apparatus and equipment.

It is expected that hundreds of volunteer departments will participate in this big event.

Gordon Wilson is Chief of the Red Bank Fire Department.

Another Fatal Nitrate Blast

Between eight and twenty-eight persons were killed and several hundred (some reports say thousands) were injured, while port and business areas were set afire, following the explosion of the nitrate-laden Norwegian Liberty Ship "Ocean Liberty" just outside the harbor of Brest, France, on July 28.

The explosion followed a fire, discovered in the hold of the ship under conditions similar to that in the *S.S. Grandcamp* which touched off the Texas City disaster. Profiting by the earlier tragedy, however, French Naval authorities acted promptly and when quantities of water from patrol and fire boats were futile, the burning ship was towed to what was considered a safe distance from other shipping and shore installations, where the explosion came five hours later.

The original blaze, however, spread to the dock and flimsy structures erected since the bombing of the city in the last war. A warehouse also became involved, but whether from the explosion or not is not explained at this writing.

One of the victims was reported to be the ship's master, Erveus Holft, who was killed by flying metal. He had come ashore after watching the unsuccessful attempts to extinguish the fire aboard his ship.

The "Ocean Liberty" was loaded chiefly with ammonium nitrate. What caused the fire is as yet unknown. Although the safety precautions taken reduced the loss of life, compared with the Texas City tragedy, it is reported that hundreds were injured because they remained on the waterside to watch the burning vessel. Following the blast, hundreds more fled the city in the blistering sun that went above 100 deg. F.

The ship, laying at her dock since early morning, was found afire at noon and the security force, unable to control the fire, ordering the crew to abandon ship, manned the vessel and started towing it out of danger. When the flames became unmanageable, the "Ocean Liberty" was towed into the great harbor, and Admiral René Robert, Maritime Prefect, ordered a gunboat to open fire in an effort to explode or sink the ship. This was unsuccessful. Later, when the explosion finally came, waterfront buildings were smashed and wreckage strewn over the city. Nearly every house in Brest was damaged, it was reported. About fifteen minutes after, the blast tremors were felt in Cornwall and South Devon and in Surrey and the Isle of Wight, in Britain.

Flimsy wooden structures continued to burn late into the night despite efforts of local firemen.

The "Ocean Liberty," a 418-foot, 7,176-ton freighter sailed on July 11 from Pier 34, Atlantic Basin, Brooklyn, with a crew of thirty-five for Antwerp and other ports. According to New York agents for the vessel, she was unloading at Brest when last heard from. She was built in 1943 in South Portland, Me.

First reports said that the freighter was blown apart by the blast and sank but it was later learned that although wrecked by the fire and explosion, she was still afloat in the roadstead. The blast is said to have set the city's gas plant and oil depot ablaze, sending flames into the business district.

Loss estimates vary all the way from $800,000 shore damage to $8,000,000.

Losses Continue to Grow

U. S. fire losses during the first six months of 1947 were estimated at $369,276,000, it has been announced by W. E. Mallalieu, general manager of the National Board of Fire Underwriters. This is an increase of $71,970,000 or 23.6 per cent over losses of $297,306,000 for the first six months of 1946.

During June, fire damages were estimated at $50,840,000, an increase of 14.9 per cent over losses of $44,240,000 in June last year, and a decrease of 10.1 per cent from losses of $56,545,000 in May 1947.

June's fire losses were the highest on record for this summer month since the National Board of Fire Underwriters began estimating monthly losses in 1929. The six months' total, $369,276,000, is greater than the whole year's losses in any year from 1933 to 1942 inclusive.

Waste by fire for the 12 months period ending June 30 was computed at $633,457,000, the highest in U. S. history, an increase of 22 per cent over losses of $519,244,000 for the similar period ending June 30, 1946.

These estimated losses under fire insurance policies are on an incurred basis, including an allowance for unreported and uninsured losses.

First "Conventioneer" from Afar Arrives

Fire Chief Cipriano Cruz, head of the Manila, Philippine Islands, Fire Department, reached New York, July 12, and promptly reported to New York Fire Headquarters, where he was received by Commissioner Frank Quayle and Deputy Commissioner Moran, and other officials of the force. After checking his August hotel reservations for the I.A.F.C. Convention, Chief Cruz spent some days "rolling" with crack New York fire companies. In the above picture, Chief Cruz is being welcomed by Fire Commissioner Quayle, while Commissioner Moran and Captain Whitley (left) look on.

Texas City Losses Adjusted

More than 90 per cent of the total number of claims in connection with the Texas City disaster, April 16-17, have now been paid, it is revealed by Donald B. Sherwood, general adjuster of the National Board of Fire Underwriters.

A total of 3,264 losses have now been paid, representing a total of $2,777,746, which money has gone toward restoration of businesses and dwellings, repair of which is virtually completed, Mr. Sherwood said.

About 400 additional claims, representing the balance of $32,850,000 estimated total loss from the explosions, remain to be cleared. The major loss was incurred at the big industrial properties such as the Monsanto Chemical Co.

Another Amusement Park Fire

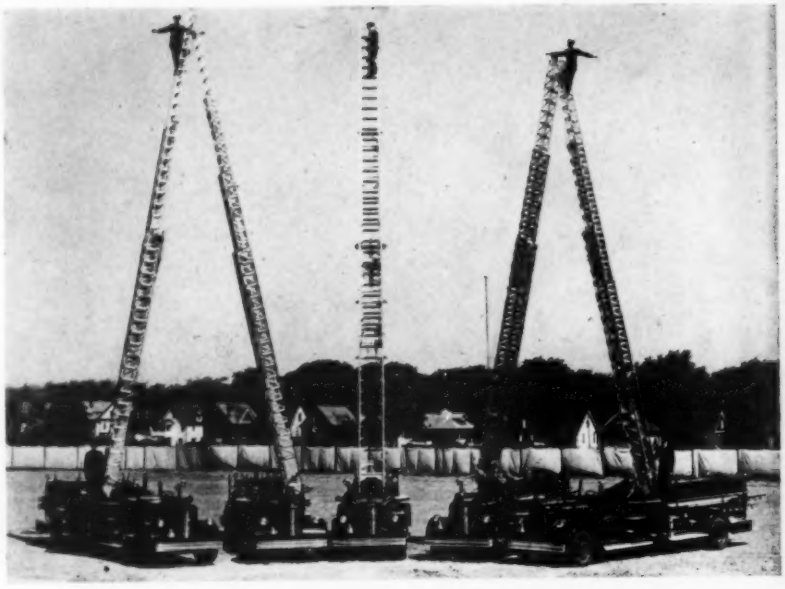
The summer's total loss in the amusement park occupancy group climbed anew with the destruction of two-thirds of Fairyland park, in Kansas City, Mo. Loss was set at $235,000 as fire razed the Sky Rocket roller coaster and six other park structures.

Fairyland park has suffered several fires, the worst, on June 27, 1943, when a blaze wiped out sixteen out of twenty-four concessions, causing half a million loss. In 1938 fire destroyed the "mill chute" concession with $25,000 loss. In 1941 lighting struck and wrecked the Sky Rocket, with heavy loss.

The latest fire started in the men's locker of the swimming pool adjacent to the Sky Rocket and was discovered about 2:45 A.M. by a watchman, who called the fire department and opened gates for the entrance of apparatus to the grounds. He then awakened the park owner who lived on the site, and he in turn awoke and helped remove two families living in the pool structure.

Cause of the fire was not determined. The high west wind helped confine the flames to the roller-coaster, swimming pool area, the oldest section, but whipped the blaze through women's and men's locker rooms, a cafeteria, game ball, shooting gallery, and a home. Six hose and two ladder companies were unable to prevent the almost total destruction of the Sky Rocket.

According to John Waas, the chief trouble in fighting fires in this park is the absence of hydrants, and the difficult approach to the park grounds. In this fire several hose lines exceeded 1,000 feet.



Rochester "Ups" Ladder Equipment

Rochester, N. Y., is proud possessor of five new Peter Pirsch Hydro-mechanical aerial hoist and aluminum alloy lattice-girder type aerial ladders. Each truck is equipped also with a complete set of Pirsch aluminum alloy ground ladders.

New York State firemen who attended the recent convention in Rochester witnessed demonstrations of these newest units.

N. Y. Fire Dept. Photo by Rappaport

Finale of Midnight Alarm to Thrill Chiefs

Over 700 officers and men of the New York Fire Department, with nearly 100 beautiful girls, will comprise the cast of the Department's spectacular extravaganza, the "Midnight Alarm," which will be held in Madison Square Garden, August 18, 19 and 20 for the Fire Department Welfare Fund. On Wednesday, the 20th, registrants at the International Association of Fire Chiefs, in convention at that time, will be the guests of the New York Fire Department at the evening performance. The Midnight Alarm combines drama, mirth and music on a scale not achieved by Barnum & Bailey. Participating, will be full fire-fighting assignments of the metropolitan fire forces, with the Fire Department Band and Glee Club, and a bevy of beauties in the extra act "Sidewalks of New York" which will include musical numbers of the Gay Nineties. Then comes the burning of "Cob Web Hall" with response of Manhattan fire companies right into the Garden and ensuing rescue and fire control operations. The climax will be a never-to-be-forgotten drill by the Department's Probationary Firemen—over 500 strong—similar to that shown in the illustration.

Local Control Again for British Departments

The National Fire Service, of Great Britain, more generally known as the NFS, was formed in the stress of war, in 1941, when the 1600 separate fire brigades of Britain were put into a standard uniform, given standard equipment and grouped under the direct authority of the Home Secretary.

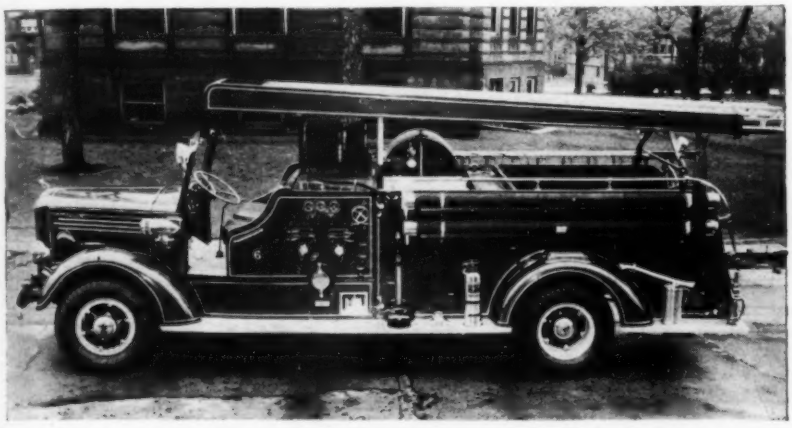
The amalgamation meant the disappearance of the volunteer brigades in the villages. In the place of 1600 separate pre-war fire brigades came the National Fire Service, equipped with the latest thing in wartime fire fighting appliances and army-type tin hats instead of the traditional brass helmets.

Recently the Home Secretary has announced that next year the National Fire Service will revert to local control, not by towns as before the war, but by counties and what are called county boroughs. This is largely for financial reasons, but they are going to keep their uniforms and their methods of control and of operation.

Manufacturers' Announcements

Pumper-Carbon Dioxide Fire Trucks

The Hammond (Indiana) Fire Department has added to its equipment roster two new combination pumper-carbon dioxide fire trucks, the first of their kind to go into service in any community. While many all-carbon dioxide trucks of 2 to 3 ton capacity are in use, and portable CO_2 extinguishers are carried on most fire trucks, these Hammond trucks are the first pumpers to include full-scale use of carbon dioxide as part of regular equipment.



One of Two New Combination Pumper-Low Pressure Carbon Dioxide Trucks Added to Hammond, Ind., Fire Department Equipment. Trucks Are 1,000 G.P.M. Capacity and Carry 750 Pounds Carbon Dioxide Unit with 300 Feet of Carbon Dioxide Hose.

The trucks are 1,000 gpm pumpers built by Mack Manufacturing Corporation. The 750 pound capacity low-pressure carbon dioxide units are manufactured by Cardox Corporation of Chicago.

Water equipment includes four 2½-inch hose lines, one 1½-inch hose line and a ¾-inch line operating from a 100-gallon booster tank. Both straight and fog type nozzles are provided for the 2½-inch lines. The trucks can carry 2,000 feet of 2½-inch hose line and are equipped with a variety of ladders, portable hand extinguishers and entry tools.

In developing specifications for these trucks the aim of Chief Joseph Scherer and the Hammond Fire Department was to arrive at as versatile a piece of apparatus as possible. The units will be used at separate stations where a wide range of fire problems are encountered.

The requirement of 750 pounds of low-pressure carbon dioxide on the trucks was based upon experience gained in three years of operation of a 2-ton capacity, all-carbon dioxide truck owned by the department. This Cardox truck, which goes out with the squad car of the central station on all runs, has proved successful in extinguishing basement fires, electrical fires, fires in walls and attics of homes and industrial fires of many kinds where water could not be used.

Hammond is in the center of the northern Indiana refinery area and a great number of such trucks travel its streets. The carbon dioxide fire truck has frequently been called to these and other specialized types of fires in cities in the Hammond area and surrounding areas.

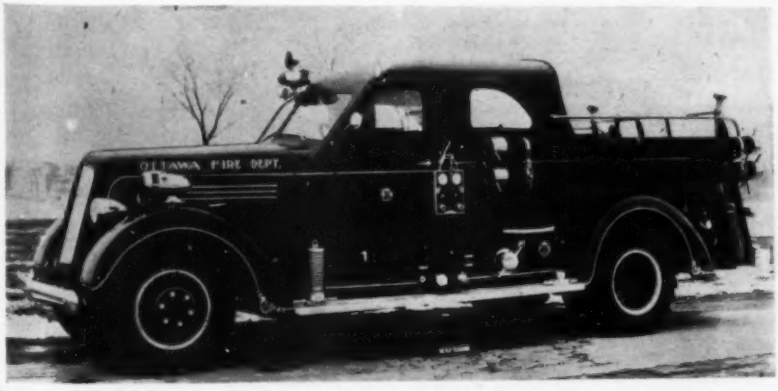
Oren Announces New Line

The original Roanoke Welding and Equipment Company and the Oren Fire Apparatus Company, Roanoke, Va., are being merged into the new Oren Roanoke Corporation, the facilities and personnel of each being pooled for what is hoped will be a most effective organization with a production capacity capable of better handling the growing demand for Oren Fire Apparatus.

Shown Above Is an Oren 750 G.P.M. Triple Combination with Compartment Type Body, 400 Gallon Booster Tank, and Other Features, Recently Delivered to Uhrichsville, Ohio.

Oren now offers, in addition to its line of 500 and 600 G.P.M. and booster apparatus, a complete line of triple and quadruple combinations, with pump capacities up to 1500 G.P.M., built on newly designed light weight chassis with high output engines. Five choices of power are available, 240, 225, 190, 150, and 130 B.H.P.

Features of the new Orens include: fully closed pump compartments, larger booster tanks, extra wide cabs and hose bodies, divided hose loads, compartment type bodies. Details and specifications may be had by writing Oren Roanoke Corp., 1201-09 West Salem Avenues, Roanoke 16, Virginia.



Ottawa, Ontario, Gets New Pumper

The first post-war, streamlined combination pumper, booster and hose truck to roll out of the Woodstock, Ont., plant of Bickle-Seagrave, Limited, has gone to the fire department of Ottawa, the Dominion's capital city. Fire Chief Gray Burnett personally escorted the new truck from the plant and along the Ontario highways to Ottawa where he supervised a test demonstration for civic officials. The pump is a Seagrave two-stage centrifugal all-bronze fire pump rated officially at 750 G. P. M. at 120 pounds from draft and 900 Imp. Gals. at 120 feet from hydrant. It has a Seagrave closed loop cooling system. The truck is powered with a Seagrave V-12, 190 H.P. engine.

Fire Protection for Mattresses

A new fire-resistant material suitable for mattress ticking and covering, designed to prevent bedding fires in hotels, institutions and homes, has been developed by Irvington Varnish & Insulator Company, Irvington, N. J.

Marketed under the trademark name

Irv-O-Glas, the fabric consists of a Fiberglas base lightly coated with a plastic material which is washable, non-allergic and sanitary, as well as fire-resistant.

E. & J. Occupies New Plant

E. & J. Manufacturing Co. of Glendale, California, have moved into their new plant which, the Company states, is the largest in the world devoted exclusively to the manufacture of resuscitators.

The new plant is architecturally designed to produce mechanical resuscitators with control testing at every step in the process.

One of the unique features is a sound proof, air conditioned testing chamber in which the mechanisms are tested for timing and accurate function by skilled artistans.

Most modern machinery and methods are employed. Production, the Company reports, has reached peak capacity and additional construction now under way will double the present capacity.

Philip L. Stanton, for many years Manager of the E. & J. Company of Pennsylvania, has been appointed General Manager for the E. & J. Manufacturing Co., and is succeeded in the Philadelphia office by Lee Weckerly.

Left: Testing Chamber, Soundproof and Air Conditioned. All Final Adjustments and Tests on E. & J. Resuscitators Are Made Here Under the Supervision of Roy Fox, Plant Superintendent. Right: Shipping Department Where Final Testing, Packing and Shipping Take Place.

Cargo of Carbide Makes Stubborn Ship Fire

The Liberty ship, "Charles Nordhoff," New York to Trinidad, recently got into some heavy weather. The cargo in No. 4 hold, consisting of onions, grease, oil, pipe, machinery, dump trucks and carbide shifted. Fire resulted when acetylene gas was generated from broken carbide drums. The skipper sealed No. 4 ventilator, turned on the steam to smother the fire and headed for Norfolk, Va. Some hours later the ship was met by the Coast Guard which pronounced the fire "out." Next day, as the ship was at anchor in Hampton Roads, the Captain discovered that the fire was still burning and requested assistance. Navy tug, YTB-219 from the Norfolk Station of the 5th Naval District (4000 gpm pumping capacity) laid 2½" and 1½" lines to cover the opening of No. 4 hold.

Fire was observed in the jumbled cargo on the port side of the tween-decks. Examination disclosed that acetylene gas was the major source of the fire, although some dunnage, oil, grease and onions were burning. Several of the blazing acetylene drums were removed by manhandling them into garbage cans but it soon became apparent that gas was being generated from a point distant from the fire and that it would be necessary to remove a great part of the cargo in order to get out all of the carbide drums.

This operation continued for almost 20 hours. As stevedores removed the cargo, firefighters corraled the drums of carbide into garbage cans which were then hoisted out. As each individual blazing drum was extinguished on deck, it was punctured and dumped over the side. It was necessarv several times to burn off accumulations of acetylene gas generated as broken drums of carbide fell into the water in the hold.

A torch attached to a 20-ft. steel rod was used to keep the acetylene ignited but minor explosions were frequent due to liberated acetylene in remote parts of the hold coming in contact with the torch. Acetylene gas bubbling through water which contained foam residue (liquid foam was used in the early stages to combat blazing oil) generated acetylene filled foam and it was necessary to keep breaking down this foam to prevent heavy accumulations and explosions.

Fire fighting operations commenced about eleven o'clock in the morning under the direction of Rodney Cox the Fire Marshal of the 5th Naval Dist. The fire was out at 7:26 the following morning when the last of the carbide was scattered on the water and burned itself out.

JERRY DALY.

Fire Alarm Calls Blood Donors

At 12:35 P.M., May 15, a special call, sounded on the diaphone of the Mamaroneck, N. Y., Fire Department, sent its members hurrying to their respective companies. Less than an hour later, seven of the volunteers were speeding to New York Hospital, in Manhattan, to donate their blood to a former member of Mamaro Company, one of the Village's five fire companies.

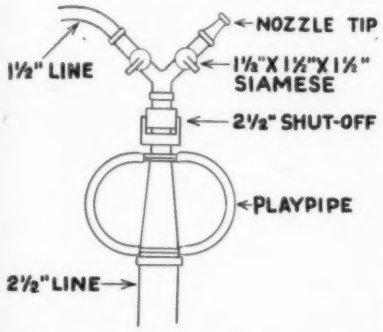
Joseph Costello, former star football player and fireman, underwent a series of major operations that left him at death's door. When almost continuous bleeding threatened his life, doctors called for special blood transfusions and Costello's fellow vamps responded, under Fire Chief Michael Orsino. All told, eighteen firemen donated blood within a period of a week. Hope was held out for Costello's recovery as a result.

Left: Modern Lathe Equipment in E. & J. Plant. Right: New E. & J. Plant in Glendale, Cal., Designed to Provide the Most Modern Facilities for the Engineering and Manufacturing of Resuscitators.

Short Cuts and Gadgets

IDEA FOR LEADER LINE ASSEMBLY

According to another newcomer to this department, Winston Gress, "Fire Fan" of Dayton, Ohio, he's spotted the following assembly in quite a few departments and claims it is used with considerable success.



The assembly consists of a regular 2½-in. shut-off and playpipe to which a 1½-in. siamese is attached. A 1½-in. leader line is attached to one outlet of the siamese and the 2½-in. nozzle tip is carried on the other outlet. If it is found that the single 1½-in. line cannot hold the fire, either another 1½-in. line can be connected, or the siamese can be removed, the tip attached, and the 2½-in. line used.

The accompanying diagram tells the story.

* * *

ADVISORY COUNCIL WORKS

It's not a particularly new idea, but it's worth passing along to those who might not have thought of it. And it is particularly pat at this time when fire department personnel—officers and men—must pull together.

In Davenport, Iowa, Fire Chief Lester Schick, who took over the post as head of the department in April, has appointed a new "Advisory Council." Its main objective is to work out the various problems that confront the department, on the theory that sometimes two (or more) heads are better than one.

The council is composed of Assistant Chiefs Fred Swenson and James J. Quinn; Captains William Christiansen and Othmer Mangels (who serves as recording secretary) and Firemen LeRoy Sternberg and Joe Burke. Chief Schick is chairman of the Council. The chief and his two assistants are automatically members of the council, while two are chosen by the chief and two elected by the local fire fighters' association.

* * *

DATED RUBBER SAFETY GLOVES

Rubber gloves are a "must" in every fire department. One of the major factors in their use is to see that they are kept in good condition, so they may safely be used at all times.

This calls for periodic testing and constant checkup—particularly after each use. It calls, also, for some method of notifying firemen who may be called on to use the gloves that they are in good condition.

Different fire departments have different methods of testing gloves and of recording the tests. In Toledo, Ohio, our roving reporter was shown how that fire department's Rescue Squad handles the situation.

Three sets of gloves are racked upright, flat, in holders, on the inside door of a compartment on the truck. With each pair is a tag giving the date of the last test; by whom it was made and other details. Before the gloves are to be used, the respective tags may be consulted by the user "just to be sure!"

* * *

TO IMPROVE THE SIREN

From Edwin H. Deuchler, Jr., Kenmore, N. Y., comes this idea for more effective use of the fire siren. Here's what he says:

"I thought most everyone knew this "short-cut and gadget" but I recently made a check and found there are a lot of fire chiefs not using this one. Maybe there are others around the country who would like to use it.

"The idea is to hook up the siren for use on the regular automobile horn button when installed on passenger type automobiles. The installation employs a double-throw single pole switch and a separate siren relay as per the attached sketch. It does away with reaching for a separate switch with hands or feet, permitting operation of the car in a normal manner when responding to alarms.

"It also eliminates the necessity for bringing current carrying, large size wires, inside the fire wall and permits shorter siren leads, with better results. About the only precaution is to be sure the contacts of the relay are of sufficient rating to carry the load of whatever siren is being used.

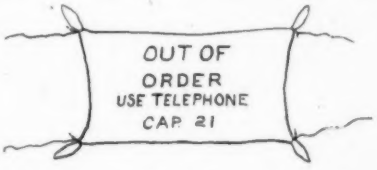
"I have made this type of installation on the fire chief's private automobile here in Kenmore and he is more than satisfied (this is a volunteer department)."

The editors will be glad to hear from readers what they think of Mr. Deuchler's suggestion.

* * *

WHERE BOX IS OUT OF ORDER

Among the earliest "short cuts" published in this feature was one for designating fire alarm boxes which for any reason are "out of commission." A

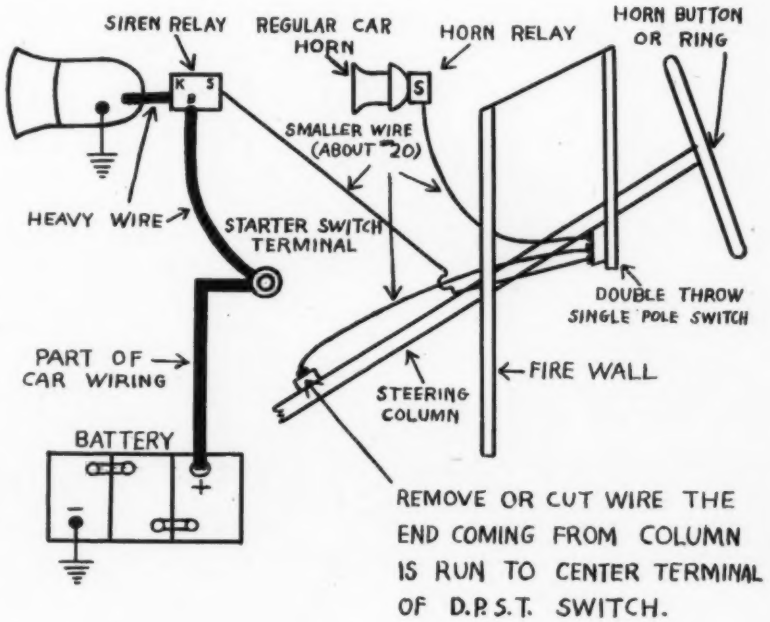


further suggestion for meeting such a condition is offered by Contributor Henry T. Hanson of Maynard, Mass. He says:

"In regard to signs warning of fire alarm boxes being out of order, one of the best materials for such signs can be obtained from cotton flour bags, such as can be found at any commercial bakery.

The bags are slit down the sides, making a long strip. These can be sent to a laundry to be washed and run through a press. They are then cut across every ten or twelve inches. The printing can be done by a job printer having a hand-feed press.

A stout piece of twine about a foot long is tied to each corner. This type of sign is tied around the box so that even a person unable to read would realize that there was something wrong and the box should not be used. A sign of this material will stand wind and rain and can be used over again indefinitely."



The WATCH DESK

Overhauling the firemanic news of the day

by ROI S. WOOLLEY

This We Gotta Pass Along!

From a contributor who, for obvious reasons, prefers to remain "incog," comes this choice bit.

Report from Fire Chief of large town who was requested to obtain information as to the state of the fire department in nearby village whose fire chief had failed to answer questionnaire giving details of his fire department and apparatus:

"The Town of ..... is situated 12 miles from ..... and I believe they had at one time a 50-gallon chemical tank. I am informed that last winter they loaned this to a bootlegger to make a batch of liquor and unfortunately the fire went out in the shack where they were manufacturing the liquor, with the result that the chemical tank froze up and busted, which leaves them in the embarrassing position that they have no fire protection whatsoever."

* * *

Tale of the Seven-Toed Cat

Peggy Stearman, daughter of Fire Chief LaVerne Stearman of the Emmett Township, Mich., Fire Department, has a seven-toed cat. Somewhere in the feline's antecedents there entered a fascination for the fire service and this was handed along to Peggy's pet which took to sleeping on top of the fire truck at the local vamp's station.

That's about as far as pussy's "buffing" goes, however, because when an alarm hits in, the seven-toed kitty refuses to ride along with the lads, and instead departs "toot sweet" for parts unknown.

Some time ago, however, whether from whim, fear or whathaveyou, Peggy's pet rode the rig on an alarm—and that was enough for her, or him, or it. In the excitement of the fire the pet disappeared. Days passed, and no seven-toed feline returned to Peggy, or to the fire station. Then, one day two weeks later, the lost cat arrived at a window of Peggy's school—Southeastern High—whereat there was much rejoicing.

Fire Chief Stearman fails to state whether or not his daughter's protégé has renewed her, his or its fire-house buffing.

* * *

A Junior George Washington

In Valdosta, Ga., there lives a Mr. James Paramore, who has a small son Alex, aged five. There is also a fire department headed by Chief T. M. Cook.

Now that the stage is set the rest of the story goes this way: Not so long ago there was a mysterious fire in the shrubbery of Mr. Paramore's home which according to the Chief started in straw and leaves were raked around plants, which were burned, together with a double canvas awning. One large window was cracked by the heat and considerable paintwork blistered.

No one seemed to know the why or wherefore of the fire until that night when Senior Paramore reached home, Alex went to him and said "Daddy, I did it. I was playing with a box of matches."

It was serious business for a five-year-old son and papa Paramore handled it seriously. Next morning Fire Chief Cook had two visitors, small Alex and his dad.

After his father introduced him to the Chief the youngster stepped forward and told the Chief just what he had done. The latter proceded to give the boy a man-to-man talk on the dangers of fire, and particularly of playing with matches, citing sad examples that had recently happened nearby. When Alex and his father left, the Chief had won the lad's confidence, and a promise "not to do it any more."

"Wouldn't it be fine" declared Chief Cook, "if all parents would bring lessons of such things home to their children right when they are done?"

* * *

Hot Off the Ticker

William Huenergardt, a tool engineer for the Reynolds Pen Company, was fatally burned in flareback of a workshop stove. He was a designer of the ball pen. . . . In Long Beach, Cal., Amos Heneise, city fireman, was bothered by prowlers. So he rigged up a burglar alarm, consisting of a shelf from his refrigerator and an electric bell. He told police that now he's looking for a burglar-proof burglar alarm. Seems some misguided miscreant slit a screen and stole his shelf and bell. . . . Editor Wallace Odell of the Tarrytown, N. Y., "Daily News," vice-president of Westchester County Publishers, was painfully burned when a folder of paper matches flared up as he was attending the Rotary Club luncheon. . . . Glenn Ford, Hollywood actor, co-star of a civil war film, was also burned on the hand by the explosion of gasoline being used in a fire scene. . . . Firemen of Newark, N. J., and Scarsdale, N. Y., evidently live a "cat and bird" existence. In Newark a cat defied Police, Humane and Fire departments, to establish a new feline tree-sitting record. Firemen finally got the feline off her 75-foot perch. In Scarsdale, a woman reported a nest-building robin had become entangled in a piece of string and was trapped in a tree high above ground. Firemen laddered the tree, brought bird to earth, cut his bonds and freed him. . . . More than 750 firemen participated in the annual Volunteer Firemen's United Memorial Services in Woodmere, L. I., on May 18, sponsored by the Nassau County Volunteer Firemen's Association, Exempt Firemen's Association, the Fire Chiefs' Council of Nassau County, the South Shore Volunteer Fire Department Association and the North Shore Fire Council, all of Nassau County. . . . Mysterious blast in water cooler of a section of a "Jim Crow" passenger coach on a Santa Fe train injured two men seriously and considerably damaged the coach. . . . In Chicago, rescuers using cutting torches worked feverishly to free a locomotive fireman pinned against hot firebox of an overturned locomotive. The fireman suffered severe burns, but lived. . . . In East St. Louis, Ill., Assistant Chief Leon Doherty always listens in on his police radio circuit when driving his automobile off duty. He was driving home early one day when he heard a fire alarm report. He speeded up and was just in time—the first fireman on deck—to carry his invalid mother from his blazing apartment. . . . In Philadelphia, Pa., firemen answered a downtown fire alarm to find plenty of water there, but no fire. Janitors at a paper company decided to use fire hoses to wash down the floors of the building. The hoses were attached to a sprinkler system and the discharge of water set off the alarm. . . . State and

(*Continued on page* 596)

Picture of a Dream Eating!

About the time the Los Angeles County Pension Plan went into effect, Engineer Murry Bell of that department was asked what he most wanted when he got out of the force. He said: "the day I retire I would like to have the Battalion Chief serve me breakfast in bed." So, it came to pass that on the morning of Murry's retirement, as some 150 members of the department gathered at Engine 17's quarters to pay their respects to pensioneer Murry, his wish came true. The men of the Company rolled the Engineer's bed out onto the apparatus floor, tucked Brother Bell, night clothes and all, between the sheets, and Chief Klinger served him his breakfast with all the fixin's. Murry's only comment was "Twenty-five years is a long time to wait for this." (Thanks A. C. Wilie, L. A. Co. F. D.)

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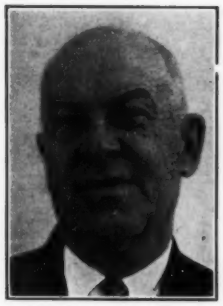

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FIRE EQUIPMENT MANUFACTURERS AND REPRESENTATIVES.

For Practical Discussion of Current Fire Department and Fire Management Problems

JUVENILES—AND ARSON

THE discussion in this Round Table is a continuation of that which appeared in the April, May, June and July issues of FIRE ENGINEERING on juveniles and arson.

The generous response from our readers makes it necesasry to carry the discussion over to this issue.

Readers are invited to send in their comment on this subject and on next month's subject which is described in a box on a subsequent page. Address communications to Round Table Editor, FIRE ENGINEERING, 24 West 40th Street, New York 18, N. Y.

Discussion of the Topic

Arthur R. Kring, Chief of Fire Prevention, Fort Wayne, Ind.: During the past year we have experienced fourteen cases of juvenile fire setting. None of the fires developed into major proportions.

We believe the basic cause of juvenile fire setting can be attributed to inhibited curiosity and lack of character; this latter, of course, is due to improper education and training.

Our suggestions for correcting this dangerous development would be:

1. Full responsibility and restitution for such acts to be borne by the parent or guardian of the juvenile.

2. Emphasis on training and character building to be fostered in the home.

3. As an aid to the parent or guardian in training and character building, there should be an elimination from the movies, the radio and reading matter including so called comic sections of the "wild-eyed", "blood and thunder" trash, which we believe inspires so much deviltry.

4. The President's Conference, Educational Section, should devise means and methods for the adoption and inclusion of fire prevention teaching in the curriculum of the schools.

5. The church should re-emphasize the teaching of personal responsibility for cause of fire, as indicated in the Twenty-Second Chapter of Exodus.

C. W. Ogborn, Chief, Columbus, Ohio: One hundred twenty-one fires are known to have been set by juveniles during the period under discussion. None of these reached major proportions.

We believe there are several causes, such as: lack of proper training in the home and schools, fire stories on the radio, in comic papers and motion pictures.

In Columbus, every suspicious fire is investigated. Where juveniles are involved, they and their parents are ordered to appear before the fire chief. After hearing the evidence concerning the case, he may do any one of the following: He may order the parents to pay the damages caused by the fire. He may turn the offender over to the Juvenile Bureau of the Police Department. He may turn the offender over to the Juvenile Court authorities. Where circumstances warrant, the offender may be ordered to report at the fire chief's office every Saturday morning for several weeks.

Many cases are interesting and show careful planning. For instance, in 1945, we had several fires near a school, and always about the time school would take up for the afternoon classes. In every case the fire appeared to be of suspicious origin.

School authorities were contacted and requested to be on the lookout for any pupil who was late, or nearly late, at any time the fire whistles were heard. A few days later, a twelve-year-old boy was almost late for class, and in a few minutes his teacher heard the fire whistles. The fire department was notified and after some questioning the boy admitted setting all of the fires in the neighborhood.

He explained that he would get his materials ready while on his way home for lunch and would stay at home until just a few minutes before school time. He would then run to the place where he had made the preparations, start the fire and run to school. He said that he hoped to establish an alibi by being in school when the fires were discovered.

In explaining why he set the fires, he said that every few days he would get a nervous feeling in his stomach, and after setting a fire, the nervous feeling would go away. The boy was turned over to Juvenile Court and was held under observation for several months and found to be mentally sound. He was later placed on probation and has caused no further trouble.

C. G. Burnett, Chief, Ottawa, Ont.: In the past year and during the war years a number of small fires were set by children. But only one, to my knowledge, caused much damage. In my opinion, the small children of today hear so much about fires from the radio, and see their parents carelessly throwing matches and cigarettes around that they seem to be come fire minded and try their hand at a little excitement similar to pulling fire alarm boxes to hear the apparatus on the streets.

I find that the parents are mainly to blame and could prevent most of these fires by giving instruction to their children and punishing them severely if they are found setting fires or using matches.

One case comes to my mind where a number of small children bought matches nearly every day from a corner store and used the top of a church to smoke and set small fires. The merchant seemed to know but did nothing about it.

Another boy left in his home while both parents worked, heard his father talking about fires being set. With his chum he got a bundle of papers and matches and set a fire under the back porch. Before the fire was discovered by neighbors, it had entered the second floor. The boys ran away. When questioned they admitted setting the fire for excitement.

Waldo Merrill, Chief, Council Bluffs, Ia.: During 1946, we had eight fires of small damage due to children playing with matches. The total loss was $176.00.

This year we have had one fire caused by a small boy playing in a clothes closet with matches, which resulted in a loss of $406.00.

We have experienced during the past year approximately fifteen awning fires which have resulted in losses of $2,086.00. These fires, in my opinion are caused by high school boys on their way home from shows or dances around midnight. If the awnings are not rolled up tight, the kids flip cigarettes into the gap. These fires we have listed as caused by malicious pranksters, although, I can see no other reason but arson.

As to other house fires, it seems that children are left at home alone or in the care of a neighbor, and are not carefully watched. The children want to scout through the house and have to use matches to see what is in the clothes closet.

James M. Duncan, Jr., Chief, Alexandria, Va.: We have had possibly six fires caused by juveniles in the last year and a half.

I believe the laws pertaining to juveniles are too lenient. Some children have an utter disregard for the enforcement of law and order. A

(*Continued on page 614*)

HERE IS THE QUESTION

1. **Have you experienced any cases of fire setting by juveniles during the past year?**
2. **How many fires are believed to have occurred from this cause during 1946?**
3. **Did any such fires develop into major ones? If so, what were estimated losses?**
4. **What do you believe to be the basic cause of juvenile fire setting today?**
5. **What suggestions would you make for correcting this dangerous development.**

FALSE ALARMS

Three blood transfusions were necessary to save the Captain's life. The donor was a brawny young Scottish sergeant. Under special arrangements, the Captain paid him $50 for the first pint; $25 for the second pint—but by the time he'd had the third transfusion there was so much Scotch in him that he merely thanked the sergeant!

The following morning the driver was invited to breakfast. While he was eating a large bowl of porridge, the family pig kept nosing around his legs and feet. Finally, the driver remarked to the farmer, "Quite an affectionate little fellow, this pig—eh?"

"Well, no, not exactly that," replied the farmer. "He is just waiting to eat. You see, you are using his bowl."

"Did It Ever Dawn on You That the Fire Department Can Ignore These Completely?"

A doctor was trying to check an epidemic in a village. Visiting a family, he asked: "Are you taking precautionary measures to prevent the spread of contagion?"

"Yessir, Doctor," replied the head of the family. "We've even bought a sanitary cup, and we all drink from it!"

Terry: "Your brother is an undertaker! Didn't you tell me he was a doctor?"

Jerry: "I only said he followed the medical profession."

Mary had a little swing,
It wasn't hard to find—
For everywhere that Mary went,
The swing was right behind!

Hospitality

The truck operator was stranded with a stalled machine . Approaching a nearby farmhouse he knocked and asked permission to spend the night until the company mechanic came to repair his unit the next morning. The farmer obligingly put him up for the night.

Freak? Not He—

Lulu: "If you were half a man you'd take me to the circus tomorrow."

Buddy: "If I were half a man I'd be in the circus."

On getting a letter from her daughter, a student nurse, her mother was badly upset.

"I don't understand it" she moaned. "We send our daughter a good allowance, and yet she writes home that she has had to do a lot of panhandling this week."

Bliss

Pete: "I'm going to get a divorce. My wife hasn't spoken to me in six months."

Al: "Better think it over. Wives like that are hard to find."

Ambition

Three small boys were sitting on a curb. One was playing with an airplane. One was playing with a fire engine. One was reading "Esquire." A kindly old gentleman approached and asked them what they wanted to be when they grew up. The first one replied that he wanted to be a jet-propelled plane pilot. The second wanted to be a fireman. The third, looking from his magazine, replied: "Aw, it isn't important; I just want to grow up."

CUMBERLAND FIRE COMPANY

CARLISLE, PENNSYLVANIA

Organized, February 18, 1809

July 12, 1947.

The Ahrens-Fox Fire Engine Corporation,
Cincinnati 12, Ohio.

Messrs.:

In June 1916, thirty-one years ago, we placed in service one of your model K-4-750 gallon Ahrens-Fox piston pumpers.

This machine was forced to undergo the most rigid and severe type of service any fire engine was ever subjected to in this section of our state, yet, never failed us at any fire in its entire period of service.

The number of alarms answered and the hours of pumping, by this engine would I believe constitute a record of service and durability.

This July 9th we had the extreme pleasure and satisfaction of seeing our new model H. T. 1000 gallon Ahrens-Fox piston pumper go thru the official Underwriters tests.

Needless to say it so far exceeded its every necessary requirement, that a test of this type seems an idle waste of time and energy.

No words or literature can possibly do justice to this pumper.

We sincerely congratulate you on the creation and building of an engine of quality, power and beauty, plus ease of operation and endurance, for in so doing you have assuredly developed a masterpiece to equal any real fire engineer's dream.

Again congratulating you, I remain

Sincerely yours,

Blair F. Pittenger
Blair F. Pittenger
Training Director

Stephen Fisher
Stephen Fisher, President

Arthur H Fenton
Arthur Fenton
Chief Foreman

H. B. Callio
H. B. Callio, Secretary

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CARLISLE, PENNA.
reports ON PUMPER PERFORMANCE AND THEIR NEW AHRENS-FOX!

• FOR DEPENDABLE FIRE PROTECTION rely on AHRENS-FOX

Shown above is the new Ahrens-Fox Model H.T. 1000 g.p.m. Twin-Triple Piston Type, Triple Combination Pumper just delivered to Cumberland Fire Company, Carlisle, Penna.

Ahrens-Fox salutes the International Association of Fire Chiefs at their 74th annual conference . . . and pledges continued support by manufacturing fire-fighting apparatus unequalled for efficiency and dependability.

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CINCINNATI 12, OHIO

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Position of shield changed by a flip of the hand.

Protect Your Firemen's Face and Eyes with the SAFTI-SHIELD

PAT. NO. 2421427

The SAFTI-SHIELD is made of Plexiglass and Aluminum. It weighs only 14 ounces. It is easily attached to any helmet. It is crystal clear, highly heat-resistant, shatter proof, fog proof and will not discolor with use. Affords perfect protection to face and eyes against Sparks, Heat, Cold, Wind, Flying Debris, Water, Chemicals, etc. The SAFTI-SHIELD was approved and used by all Army Air Corps fire fighting units, during World War II.

Write for Details and Prices.

(Inquiries invited from dealers and distributors)

Showing close-up of construction.

See The SAFTI-SHIELD At The New York I.A.F.C. Convention Booth No. 31

FIREMEN'S SAFTI-SHIELD CO., Inc.

310 Waynesville Ave., Asheville, N. C.

Historic New York Fires

(*Continued from page* 541)

of New York County issued a statement to the effect that the cause was not yet determined, and that gas, eminating from the paint closet had exploded. No one was held to blame for the disaster.

Investigations by the fire department, underwriters board and other authorities never reached a definite conclusion on the cause, although various remedies to prevent its recurrence were recommended, chief of which were automatic sprinkler and alarm protection of all sub-surface areas in such occupancies.

Smoke Over Brooklyn

In the annals of the city's fire fighting few fires have given the department a tougher job than the "Furman Street rubber fire" of Easter (April 20) 1935.

In the city's fire houses they still talk of this blaze, for its five alarms, two master stations and seventeen calls for "men only" which it necessitated and for the lessons learned and the strategy applied in the course of its extinguishment.

Although no deaths resulted, the destruction of "Store No. 38" as it was called, located midway in a row of 5-story brick warehouses 2875 feet long along Furman Street and the Brooklyn waterfront did result in the hospitalization and treatment of more than a thousand persons, both civilian and firemen. The pall of black smoke that hung over the city spoiled the holiday finery of countless hundreds, slowed traffic and produced congestion as never before witnessed in that area. The loss of $500,000 conveys no idea of the seriousness of the fire.

At the height of the fire more than 375 members of the uniformed force from Brooklyn, Queens, Manhattan and the Bronx were in service at the scene of operations. A total of 620 men, about one-tenth the entire Department, performed duty at the fire. Of this total, 149 were injured. Approximately 900 civilians also were given treatment for shock and smoke poisoning.

The chief difficulty in extinguishing the blaze was inherent in the burning crude rubber stored in the warehouse. The noxious and explosive quality in confined spaces of the gases evolved, and the stubbornness of the burning rubber in defying the heavy fire streams gave men heavy punishment. Rubber liquefies at 600 deg. F. At the Furman Street fire, liquefied rubber flowed out of the fire-building with the boiling water.

The row of warehouses in which the fire was contained stretches north and south between Furman Street and the East River. The half-mile long structure is divided into "stores" of approximately sixty feet by 160 feet measurement, five stories in height. Furman Street, east of the building, is forty-five feet wide and the side opposite the warehouse row is of palisade effect—the occasional buildings on the east side being built into a hill. Of particular importance is the fact that the East River tunnels of the Seventh Avenue subway system pass directly under the fire building and a ventilation chamber equipped with intake fans for these tunnels opens directly opposite the fire structure on Furman Street.

The warehouse row itself is of old but sturdy construction. Walls from 16

MIDWESTERN
Protective Clothing
for Men of Action!

Here's Protection and Comfort in Your Hazardous Work of Safeguarding Life and Property Against FIRE!

Our policy remains as always . . . only the finest material is used in Midwestern products.

Raw materials to meet our rigid specifications are not available in sufficient quantities to supply the demand for Midwestern products. However, in order to deliver without delay, we refuse to buy inferior materials that will lessen the service you have a right to expect in Mackinaw Coats and all other Midwestern clothing.

As a result, we are unable to keep pace with the demand for immediate deliveries. But we pledge ourselves to maintain our reputation, to merit your confidence, by continuing to use only the highest grade materials.

You'll agree that the extra protection, built-in comfort, and longer wear you get in Midwestern clothing make it well worth while placing your order for scheduling into our production as soon as possible. There is no substitute for quality.

Have your Midwestern dealer show you our complete line now made of natural rubber. Note the softness, the flexibility, the high grade materials used to assure long service, comfort, and real protection. Now available in white and ivory rubber.

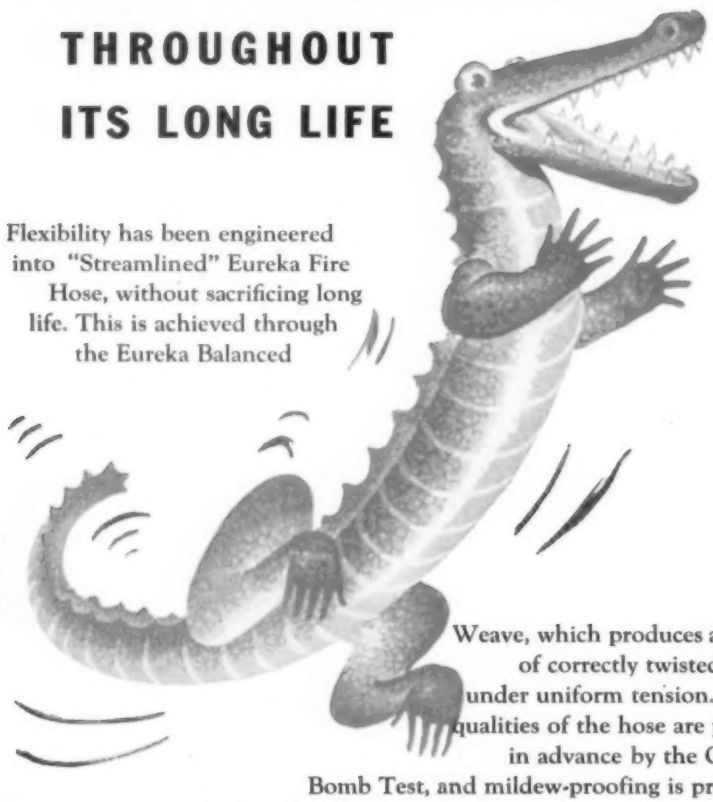
Available for immediate delivery subject to prior sale, all sizes firemen's short and 3/4 boots.

NONE GENUINE WITHOUT THIS TRADE MARK

MIDWESTERN MFG. CO., Mackinaw, Illinois

Manufacturers of the Famous **MACKINAW Coats**

KEEPS ITS FLEXIBILITY THROUGHOUT ITS LONG LIFE



Flexibility has been engineered into "Streamlined" Eureka Fire Hose, without sacrificing long life. This is achieved through the Eureka Balanced Weave, which produces a fabric of correctly twisted cords under uniform tension. Aging qualities of the hose are proved in advance by the Oxygen Bomb Test, and mildew-proofing is provided by Eureka's Formula "X".

Among the other unique advantages of every Eureka "Streamlined" Hose are Smooth Interior Filler Ply for maximum nozzle pressure, and a patented method of Controlled Curing which prevents excessive writhing and warping, permits easier handling on the ground, on ladders, or when loading on the wagon.

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Division of United States Rubber Company

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to 24 in. thickness; ground floors laid with concrete; upper flooring 1½-in. tongue-and-groove boards in double transverse layer and 4 x 12 in. wood joists, 8 to 10 in. on centers. The joists were set in wood girders on three interior rows of wood columns, with iron caps and heel plates. Ceilings were open; walls unfinished. All this timber provided fuel for the flames.

The east and west walls fronting roadways, had four large brick arched window openings without sashes on each floor. These were protected by heavy metal shutters about U. S. 12 gauge sheet-iron on 2 x 2½-in. flat frames and held closed by a strong hook to a wood beam placed across the inside of the opening. The openings conformed with the then Building Code requirements. There was one wooden stairwell from the first floor to the roof, not enclosed, but protected by ⅞-in. wood traps, provided with fusable links. Also there was a metal merchandise chute extending from first to fifth floors with automatic closing devices.

The first and second floors of Store 38 at the time were well stocked. About 4620 cases of crude rubber and 700 rolls of heavy paper were stored there. Rubber was in sheet form, each case measuring 18-in. square and averaging 224 lbs. Close to 5,000 cases of rubber occupied available space on the second floor, piled four and five cases high. The upper three floors were vacant.

The origin of the fire is unknown. A watchman reported he went through first and second floors of Store 38 at 11:20 A.M. and found all well. Another watchman closed the shutters on the waterfront side between 11:45 and 11:50 A.M. The building was unoccupied at the time. The watchman was informed by a fellow-worker that smoke was coming through the shutters in Store 38. This was verified and an alarm sent in on the special building box at 12:01 P.M.

From that time on the department had little rest. First due at the scene upon receipt of signal 3-482-2 was Engine 224 and Ladder 118. Engine 224 as it rolled from Joralemon Street encountered smoke banked up by the southwesterly wind in Furman Street. The fire already had great headway, unhindered by sprinklers or interior walls. All that prevented extension into other parts of the huge building were the dividing walls, and the efforts of the fire-fighters.

Engine 224 hooked up to a high pressure hydrant, laid out two lines, one 3-in. and one 2½-in. then drove through the narrow alley in Store 39 to the waterfront, where it operated its deck gun. The company advanced into the smoke-filled interior on orders of Acting Battalion Chief Arthur Sheehan (32nd Batt.). The laddermen opened up for ventilation and L. 118 raised its aerial on Furman Street while L. 110 did the same on the waterfront side. Chief Sheehan sent the second alarm at 12:11 P.M. bringing E. 205-204-208 and 207 and fireboats Hewitt and Harvey and L-101 with Rescue 2 and Tower 6.

A third alarm at 12:13, as the blaze continued to progress, summoned E. 226, 256 and 202 and fireboat Strong, L. 105 and Fuel Wagon 3. The aerial ladder on Furman Street was ordered removed, but because of the smoke and heat men were driven away before it could be done. Members of Rescue 2 using smoke masks were also unable to

750 to 1500 G.P.M.

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BUILT ON LIGHTWEIGHT CHASSIS WITH POWERFUL ENGINES OFFERING UP TO

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COMPARTMENT TYPE BODY EXTRA WIDE CAB and BODY LARGE BOOSTER TANK AND OTHER ESPECIALLY DESIGNED FEATURES

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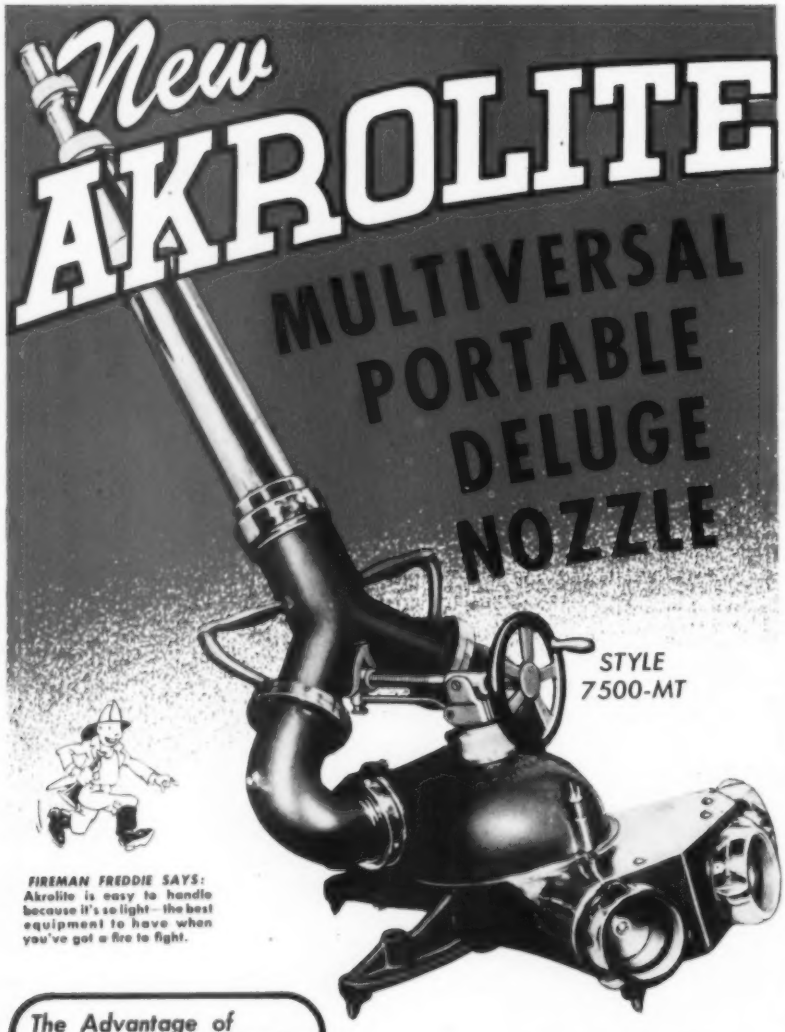
New AKROLITE MULTIVERSAL PORTABLE DELUGE NOZZLE



FIREMAN FREDDIE SAYS: Akrolite is easy to handle because it's so light—the best equipment to have when you've got a fire to fight.

The Advantage of LIGHTER WEIGHT!

Akron Brass AKROLITE Couplings, Nozzles and Fittings offer:

Two-Thirds less weight than brass

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The features which make Akron Multiversal Nozzles so efficient, are now enhanced by the lighter weight of AKROLITE — two-thirds lighter than brass — easier to handle — lessens fatigue.

Akron Multiversal Nozzle directs the stream where wanted — up or down — or in a complete circle. Once in action it stays put, releasing men for other duty.

Write today for illustrated, descriptive folder on the new AKROLITE line.

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AKRON BRASS
FIRE FIGHTING EQUIPMENT

move it, as it was glowing hot. It was not withdrawn for two days later.

Explosions of gases inside the structure continued. Nozzlemen, fighting from the street, were scattered, their faces seared and some knocked down by back-drafts. Smoke increased, making driving dangerous on the Manhattan Bridge a mile away. Boats were slowed. The intake fans of the subway sucked the noxious smoke into the tubes, to affect train crews and passengers miles away. People at the Wall Street station, across the River, required medical attention. Ambulances were hurried to subway entrances. On a special call, Ladder 15 and the 1st Battalion rolled to Wall and William Street to aid victims.

At 1:01 P.M. Assistant Chief of Department, George McKenna, now retired, sent a fourth alarm followed at 1:15 P.M. by a fifth.

The high pressure system was boosted to 200 lbs. At 2:30 P.M., the rarely-used Master Station Signal was sounded. Assistant Chief of Department David Kidney, after observing the effects of the smoke on the men sent signal 55-482-1, followed within an hour by 55-482-2.

Heavy streams from masts of three towers; two tower deck-pipe streams, thirteen wagon-pipe streams and seventy-three portable lines were also in action. It became impossible to ventilate the roof due to smoke. Shutters were knocked open, to be slammed closed again by heavy streams. The entire second floor was fully involved. It was decided to fight the fire through breached party walls on both sides of the fire and smother the burning rubber under a Niagara of water, but this strategy failed to extinguish the flames.

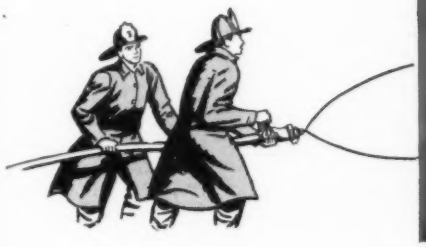
Just before the change of shifts at 6:00 P.M., Chief John McElligott ordered a special call for men only from the Divisions 13, 4 and 5. By 7:30 P.M. the entire day-shift personnel had been replaced. Nearly all required medical attention. Fifty-three firemen had to be hospitalized.

All night the battle continued. Then a new plan was tried—this to let the fire clear its own way, burning through the fallen floors, so that the heart of the fire would be exposed. Lines were deployed to confine the fire. Then foam was resorted to, to smother the blaze. Foam apparatus of the Standard Oil Company rendered valuable assistance, over 10,000 lbs. of foam powder being used. The fire was finally controlled at midnight on Monday but it was not until 6:00 A.M. Tuesday that the fire was called out, although watch lines were still maintained.

The battle was a triumph of courage, equipment and intelligence over a brutal fire, but perhaps best of all, it led to changes and innovations in the department. Some of these were: The elimination of the Master Station Signal on June 9, 1939. The purpose of this signal was to provide a prearranged plan for calling for help beyond the fifth alarm and to draw on the nearest available companies, including those that had relocated in nearby quarters. The signal had the disadvantage of stripping fire protection from large areas of the city while leaving others fully manned as if no emergency had arisen. Some box responses were revised.

Foam was considered an essential and made regular equipment on bridge chemical wagons, smoke ejectors and fireboats and rescue apparatus. Not

A THIRD DIMENSION in fire fighting!



Water *plus* a penetrant puts fires out faster and with less water damage because it gets "down in"!

Consider these three recent cases, where this new penetrant developed by Carbide and Carbon Chemicals Corporation was used to give a *third dimension—depth—to water in fire-fighting.*

Case A: 500-bale cotton fire put out with water *plus* penetrant after hydrant lines failed to extinguish it.

Case B: Dwelling fire—30 per cent fully involved—*not one* dollar of water damage—extinguished in less than 2 minutes with only 100 gallons of water *plus* penetrant.

Case C: Supermarket main floor fire—*not one* dollar of water damage to stock.

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Soon to be available commercially is this new penetrant with its plus value for water in fire-fighting. When used in fog or solid streams on Class A fires, this penetrant demonstrates that fires can be extinguished more quickly . . . with less smoke punishment to personnel . . . and a minimum of water and manpower.

Laboratory and field tests are being continued by our research and engineering staff—to determine the full extent of the value of this chemical assistant in fire-fighting. In the meantime—we will gladly co-operate with organizations interested in improved methods of fire-extinguishment. When writing please address Dept. FR.

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WRITE TODAY FOR CHARTS SHOWING COMPARATIVE RATINGS ON FLAMMABLE LIQUID FIRES AS DETERMINED BY NATIONALLY RECOGNIZED APPROVAL AGENCY.

Highest Ratings for Speed and Effectiveness

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Speedy-fast action is the first essential in preventing major fire damage. The NEW Ansul-Dugas Extinguishers, for Class B and C fires have the highest ratings for SPEED and EFFECTIVENESS, pound for pound, as determined by impartial authority. These highest ratings mean positive put-out of your incipient fires by ANY of your employees.

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- Expert extinguishing by inexperienced operators.
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- Greater fire-fighting effectiveness, pound for pound, dollar for dollar.
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- Increased fire-fighting capacity without increased weight.
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only the department but the public gained the realization of the possibilities of casualties on a large scale, and the need of being prepared for such major emergencies as this.

Texas City a Lesson in Oil Tank Fire Fighting

(*Continued from page* 544)

roadway reaching the tank farm from the opposite side would have enabled pumpers to reach water in the bay and fire fighting could have progressed immediately, thus saving many tanks.

In conclusion, the rapid development of long range war devices finds all installations, whether industrial or Naval, in this country or abroad, becoming more and more vulnerable. We are interested in providing the best possible protection and, based on experiences in Texas City, it is felt that the following measures will minimize the results of any attack on fuel storages. These are summarized as follows:

1. Provide subsurface foam injection systems for all above ground fuel storage tanks. These systems, placed underground, offer a maximum of reliability.
2. Isolate all fixed emergency equipment far from hazardous or congested areas.
3. Provide reliable, self-powered, portable apparatus housed in well dispersed locations as a standby.
4. Construct proper roadways so that regardless of fire locations, wind directions, etc., access to the hazards may be achieved by fire fighting personnel and material.

New York Fire Dept. Shops

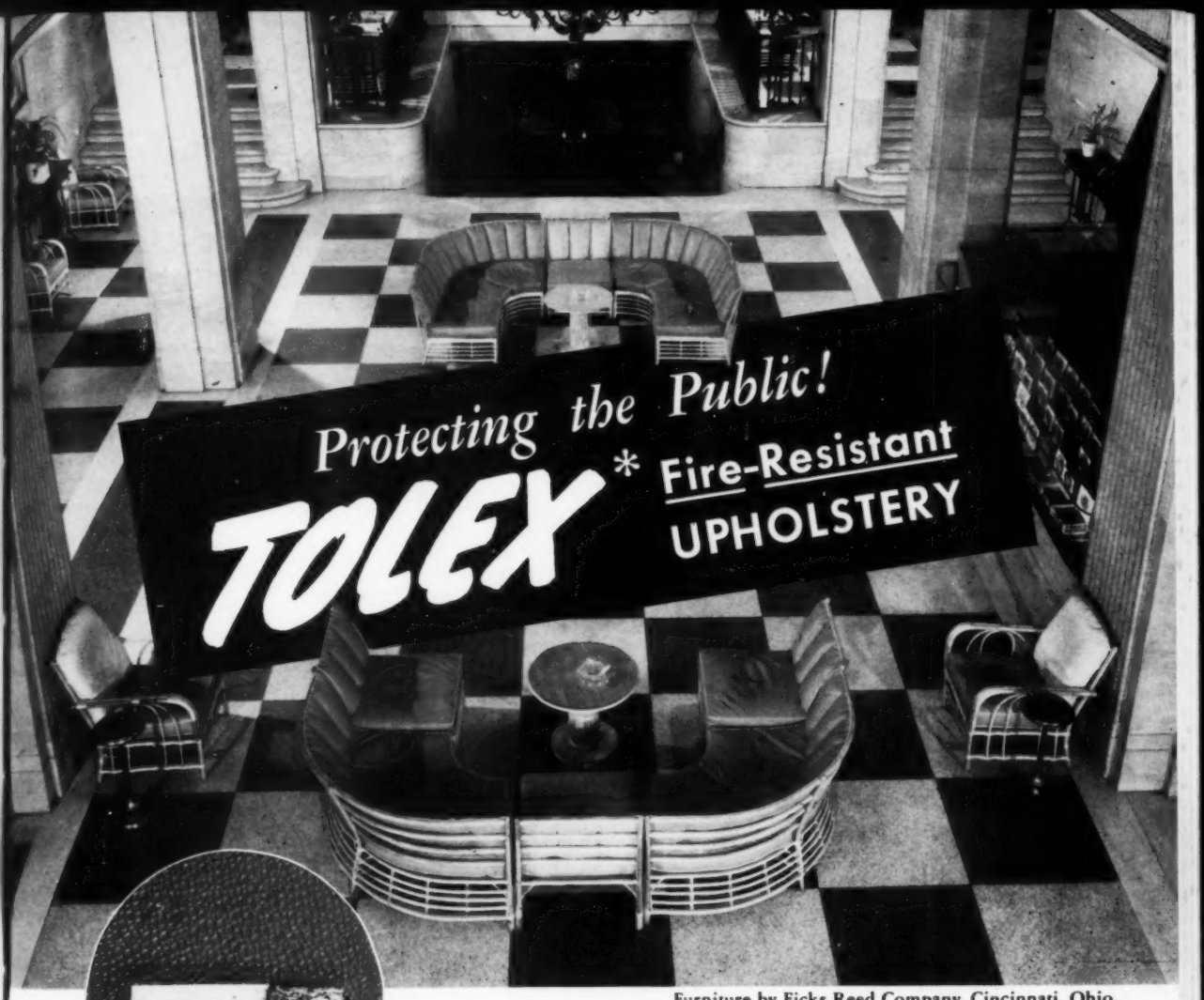
(*Continued from page* 547)

that from tests and the service records of the Division covering every make and type of apparatus in the department, operation and preventive maintenance instructions are continually being sent out to all fire fighting personnel, pump operators and chauffeurs. Usually these instructions take the form of amendments to the Official Action Guide, which is the "operational bible" of the department.

As an example, we quote from General Order No. 27, dated August 9, 1945, covering lubrication:

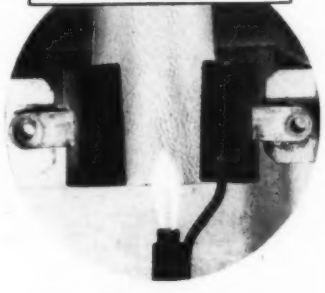
"Commanding Officers shall see that oil in the crankcase of apparatus is changed in accordance with the following schedule.

Type of Apparatus	Time to Check Oil in Case
Pumpers	Every total 12 hours of pumping operation; otherwise every 2 months.
Pumpers (spare and reserve)	When in active service same as pumpers above; when remain in quarters—no duty—every 6 months.
Hook and Ladder Trucks Hose Wagons	Averaging 50 or more runs per month—every 2 months.



Furniture by Ficks Reed Company, Cincinnati, Ohio.

Flame tests and cigarette tests demonstrate fire-resistant qualities of Tolex.



Of sterling worth, is what our own experience teaches.
—Tennyson

You can be sure of greater safety in places of public gathering . . . where fire-resistant TOLEX plastic leathercloth is used for upholstery, wall coverings and decoration.

New York City, Boston and other large cities have certified TOLEX to be FIRE RESISTANT.

In your community—a greater use of Tolex fire-resistant upholstery in hotels, bars, restaurants, theaters, auditoriums and other public buildings will help to cut down fire hazards.

Consulting Service available to you! Without charge or obligation, we will gladly send our technical representative to discuss fire-resistant leathercloth specifications and test methods with fire marshals, fire departments, fire prevention boards or underwriters. Write to . . . Textileather Corporation, Toledo, Ohio.

35 Years of Leadership in Leathercloth

**Reg. U.S. Pat. Off.*

100 FEET BELOW SEA LEVEL

FIREMEN GO UNDER RIVER TO PUT OUT TUNNEL BLAZE

Thurs., May 15, 1947—The New York City Fire Department today met an emergency described as the first of its type ever fought.

In a scene reminiscent of a coal mine disaster, firemen successfully fought a stubborn fire in a tunnel 100 feet under the East River. It was put out without loss of life or serious injury by a squad of five firemen and a Captain, all wearing Scott Air-Paks.

Excerpt from New York Herald-Tribune

Scott Air-Pak DID THE TRICK!

- **Once again** the Scott Air-Pak contributed to a reduced fire loss, and with greatly reduced risk to fire-fighting personnel.
- **Once again** the Scott Air-Pak did a job that could not be accomplished with other breathing equipment.
- **Once again** it has been proved that the best breathing equipment is the equipment ready for *any* emergency.

The fact that Scott Air-Paks were available when this emergency occurred is indicative of the far-sightedness of New York Fire Department executives charged with the protection of life and property. The safety and efficiency of *your* firemen can be immensely increased by the use of Scott Air-Paks.

ONLY THE SCOTT AIR-PAK

- **Can be used in any temperature from below zero to desert heat.**
- **Only** the Scott delivers fresh, cool, confidence-inspiring air.
- **Only** the Scott has a cylinder gauge to prevent the inadvertent use of empty or partly empty cylinders.
- **Only** the Scott has acid-proof and corrosion-proof straps and fittings.
- **Only** the Scott has a battle-tested and emergency-proved Regulator.
- **Only** the Scott has a custom-built, not a commercial, gauge, within the wearer's vision.

The Scott Air-Pak has Bureau of Mines Approval No. 1308

Write today for literature, and the name of your nearest Scott Distributor.

SAFETY EQUIPMENT DIVISION

SCOTT AVIATION CORP.

215 Erie Street, Lancaster, N. Y.

Established in 1932

Scott
FOR SAFETY—FOR SERVICE

Breathe pure fresh AIR in every breathing hazard

Type of Appar.	Time to Check Oil
Hook and Ladder Trucks Hose Wagons (Continued)	Averaging less than 50 runs per month—every 3 months.
Spare and reserve Hook and Ladder Trucks; Spare Hose Wagons; Spare Water Towers; Smoke Ejector and Foam Trucks; Fuel Wagons; Ambulances; Emergency Utility Unit; Spare Chief's Cars.	Every 500 miles. When remaining in quarters—no duty—every six months.
Chiefs' Cars	Every 500 miles.
Searchlights	Every total of 12 hours of operation when lights are used; otherwise every 500 miles.

Oil shall be drained from the crankcase only when the motor has attained proper operating temperature. The crankcase shall then be filled with new oil to the proper operating level as indicated on the gauge provided for this purpose.

It is required that reserve and spare pumpers not in active service be connected to a hydrant and run for at least 20 minutes each week.

These instructions are commonplace enough, but actually they're the result of long and careful analysis—and profiting by lessons, some of them learned the hard way. In this case the order resulted from a study of abnormal bearing trouble out of which it was found necessary to increase the oil level in certain types of motors.

The Shops have turned out some unique jobs, among them being the conversion of water towers to spring hoist (the initial conversion was made with spare ladder truck raising devices); two city service trucks were turned into smoke ejectors; five old aerials were built into relay hose apparatus with capacity of 3,000 feet of large hose, each; spare pumping engines were transformed into Bridge Chemical apparatus; Rescue apparatus was converted from open to closed units (the Department is just adding one of the most comprehensive rescue units ever built—this is the product of outside manufacture); another city service truck was remade into an "Emergency Unit No. 1" to carry twelve 250-gallon pumping units for pumping out subways, basements, etc. In addition, more than 150 pieces of apparatus were converted from solid rubber to pneumatic tires, and power brakes installed on 50 other rigs which originally had 2-wheel brakes. These are but a few of the examples of the resourcefulness and handicraft of the Division of Apparatus.

"Trouble, Trouble, Toil and Trouble"

It is said the New York Fire Department, other things being equal, ought to know more about fire fighting than any other fire department on earth, because it has the most fires and gets the most work.

By the same token, it ought to know more about servicing and repairing fire department rolling stock, because we're told it gets more of this type of business. According to the record, the Division of Fire Apparàtus handled 21,839 separate and distinct jobs in 1946, including work performed by Shop members in fire houses, but not minor adjustments handled by company personnel. That's quite a bit of business,

The newest MACK for Monterey... fully equipped and HALL-SCOTT powered!

In the rear of this up-to-the-minute triple-combination Mack are inside-mounted ladders and suction hose, special lockers, fog applicators, and a pump that delivers 1,250 gallons every minute at 150 pounds pressure.

Up front is a Hall-Scott Engine, Series 400... a power-plant with ample stamina not only to meet emergencies in jig time, but also to power the pump for 24 hours or more at a stretch!

Every Hall-Scott Engine delivers maximum torque at low r.p.m. Result: Full power with less wear, dependability at minimum maintenance cost.

HALL POWER BY SCOTT

HALL-SCOTT
MOTOR CAR COMPANY
FACTORY AND MAIN OFFICE
BERKELEY 2, CALIFORNIA
New York Branch: 254 W. 31st Street
Branches: Boston, Philadelphia, Chicago, Dallas, Los Angeles, Seattle, Berkeley.
DIVISION OF
ACF-BRILL Motors Company

especially when it is remembered that some of these operations accounted for the complete rebuilding of a piece of apparatus.

These jobs, generally, fall into two groups, those performed in company quarters, or otherwise outside the Shops, and those handled within the latter.

A quick peek at some of the records of complaints received from company quarters shows the most predominant to be: Hard starting, Improper operation of pump, Won't take draft, Generator and lighting equipment trouble, Steering trouble.

As might be expected, since the war's end, and the need of throwing all the spares and reserves (many of very ancient brand) into action in the Department, the Shop's service headaches have grown apace. And it is hardly necessary to detail here either the ills or the measures taken to cure them because nearly every metropolitan fire department has met the same trouble.

New York is perhaps more fortunate than its contemporaries in one respect, at least: as of this year, it will have the largest and best equipped maintenance and repair shops of any department in this or any other country.

The New Shops

The new Shops are located at Hunters Point Avenue and 34th Street, Long Island City, a site which although at first considered some distance from the center of the city's government, actually is strategically well placed. The location, close by the Midtown Tunnel to Manhattan, the Queensboro and Tri-Borough Bridges and Queens Boulevard, enables both the Shop's Emergency Crews and the Supervising Engineers to reach any scene of operations in all Boroughs with dispatch.

Actually, the new building will house a number of important Fire Department entities besides the Division of Apparatus and the Shops. The three foremost are (1) The Bureau of Fire Department Buildings; (2) the Radio Repair Department (and one transmitting tower of the department's Radio Station W. N. Y. F.); and (3) the Office of Supervising Engineers. The Department of Purchase will also occupy quarters in the new structure to facilitate furnishing the department with the necessary parts for the repairs of apparatus. This sub-division also plays a large part in the delivery of equipment such as axes, extinguishing agents and extinguishers, and other tools and appurtenances to the various fire houses that has been requisitioned for replacement. The Department of Purchase also carries in stock various parts for apparatus, such as transmissions, differentials and battery plates.

The Bureau of Fire Department Buildings is charged with the complicated task of keeping the 310 city fire houses in serviceable condition. Numerous mechanics, carpenters, electricians, plumbers and other specialized workers, assigned to this Bureau, are kept busy on repair work and alterations.

The Radio Repair Department has the task of installing and maintaining radio sets in use throughout the Department. At present there are three radio repairmen who in addition to servicing radio sets on fireboats, rescue squads, chiefs' and other official cars,

For
Flexibility and Efficiency
Specify HALE

It's what comes out at the nozzle that counts.

Firefighters who have used Hale Fire Pumps have learned through first-hand experience to appreciate their flexible range of performance and high efficiency.

They know they can depend on HALE for the right volume and the right pressure to fit a wide range of tough fire-fighting conditions.

Make sure of this same flexibility, efficiency and dependability in your next piece of apparatus by insisting on a Hale Fire Pump.

Hale Fire Pumps are built in all Standard Capacities . . . Sold only through Manufacturers of Quality Apparatus.

Below—Hale Type ZL Multi-Service Centrifugal Pump

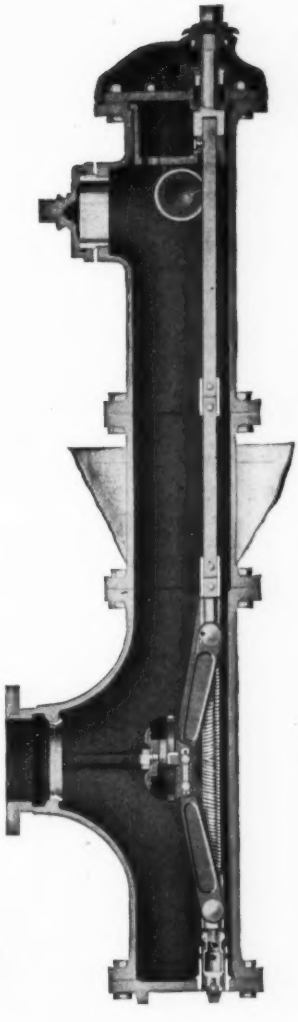
HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PA.

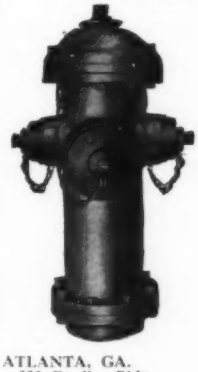
Why are we so PROUD?

The answer is simple: we have a Fire Hydrant which offers many unique and highly desirable advantages.

What are they? Well, here are a few —

1. Easier to service — Working Parts easily removed by one man without special tools.
2. Easier to Operate—works on powerful "knuckle joint" principle.
3. Ground Line Flange now standard — no digging to repair, yet full strength thruout.
4. Solid bronze Sleeve thru Stuffing Box—longer life for packing.
5. Main Valve mechanically locked in closed position — insures no "flooding" if stand-pipe gets broken.
6. Large capacity, clog-proof Drip — positive and dependable.
7. Pumper boss extra long and on plane with hose nozzles — plenty of room to swing Spanner.
8. Half a Century of constant, dependable service.





Formerly Known as "Coreys"

An "engineered" fire hydrant especially designed to deliver dependably, a maximum quantity of water in a minimum time.

Write for Bulletin "W"

ATLANTA, GA. 333 Candler Bldg.
BALA-CYNWYD, PA. 725 Kenmare Road
CHICAGO, ILL. 53 West Jackson Blvd.
DENVER, COLO. P.O. Box 5270
HAVERHILL, MASS. Haverhill National Bank Bldg.
HORNELL, N. Y. 38 Main Street
KANSAS CITY, MO. 1609 Oak St.
LOS ANGELES, CALIF. Subway Terminal Bldg.
MEMPHIS, TENN. 822 Dermon Bldg.
MINNEAPOLIS, MINN. 625 Plymouth Bldg.
OKLAHOMA CITY, OKLA. 817 Braniff Bldg.
PITTSBURGH, PA. 2203 Oliver Bldg.
SAN FRANCISCO, CALIF. 115 Townsend St.
SEATTLE, WASH. 1252 First Ave., South
WACO, TEXAS 206 Franklin Ave.

RENSSELAER VALVE CO.

TROY, N. Y.

respond to all multiple alarm fires. Radio specialists in the fire department have done considerable work in developing back-pack, or walkie-talkie radio sets.

As said, the Radio Shops will also house a complete transmitting station of the city's radio chain.

The important work of the Supervising Engineers, under Acting Chief of Battalion Harry Irwin, has already been told in some detail in FIRE ENGINEERING and needs no elaboration here except to say that in the new Shops, facilities for furthering the training and instruction of pump operators and other department personnel will be considerably enhanced.

After a careful consideration of the functional and other requirements of the Shops, and the structure to house all these beforementioned activities of the department, it was suggested by A. Gordon Lorimer, Chief of the Bureau of Architecture of the City's Department of Public Works, that in the interests of economy as well as efficiency of use, and modernity, the "Z-D system of Monolithic Construction" world best provide the desired requisites.

The building, which is said to have cost $2,500,000, was erected by the Roberts & Schaefer Company, owners of the "Z-D system" under the immediate supervision of Bernard J. Farrell, resident engineer of the Department of Public Works (Division of Construction). General contractors were Carbetta Construction Co. of New York.

The building at 154 Hunters Point Avenue, is trapezoidal in shape, running 282 feet on the 35th Street side; 216 feet on Hunters Point Avenue, 599 feet on 34th Street, and 200 feet on the north line of the structure. Fireproof construction, including the tremendous roof area, was a prerequisite, as was to be expected of a building to house such vital activities.

Perhaps the most striking of the details of design and construction of this structure is the absence of all posts, columns or supports of any kind on the main floor, which covers an area of over 100,000 square feet. This vast uninterrupted floor area is secured by means of a 3½-inch thick curved slab roof, suspended from arches on 35-foot centers. The shell structure is a multi-radius pipe sector of enormous rigidity which serves as a beam between the supporting columns.

The "Z-D system" includes the shell, which is a 3½-inch concrete curved membrane and the continuous arch framework which supports the shell. The framework consists of arches supported on columns, hinged at the base, and connected transversely by solid steel ties. In this construction, only vertical pressures are exerted by the footings upon the soil or upon the piles, as the case may be. That part of the building which surmounts poor soil is carried on 3-ton concrete piles which reach an average depth of 20 feet.

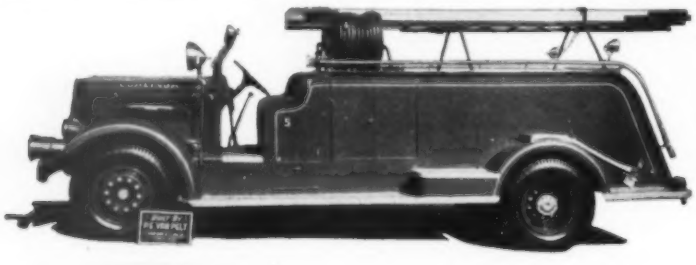
The actual construction itself of the structure was novel. The concrete for the main shell and its supporting arches was poured at the same time. The form upon which it was poured resembled a curved wooden floor supported by myriads of wooden posts which, in turn, were placed on screw jacks. The jacks themselves were placed on wooden framework which was on tracks. After the concrete mixture was placed in position and hardened, the form was lowered by means of the jacks and then moved along on the tracks to the next position. Here it was raised to its original height and was ready for the next pouring. The procedure was repeated until the entire length of the main repair shoproom (490 feet) was covered.

The entire building does not exceed two stories (32 feet) in height. It consists of three shells with the largest one in the center and the two smaller ones on either side. Only a small part of the basement area has been excavated. This section was designed for storage of cars, material and records. It houses also the boiler room, and there are spaces for the Chief and Assistant.

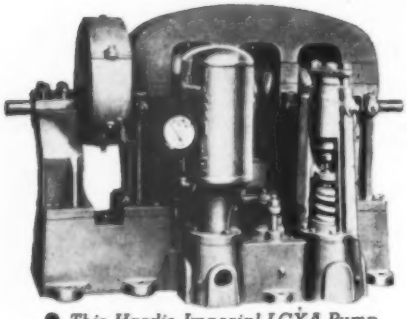
The first floor, measuring 632 ft. 3½-in. by 200-ft. over all will ultimately house in addition to the main automobile repair shop, the Division of Purchase store room; the Paint Shop; Division of Apparatus store room; Upholstery shop; Plating room; Foundry; the Machine and Blacksmiths' shops; Quarters for repair and storage of hose; Radio repair shops; Battery room; Lumber storage and Woodworking shop.

Located on the second floor are the general offices; the Bureau of Fire Department Buildings, filing, record and drafting rooms, and the toilets and washrooms.

Special consideration has been given the dead load factor of the extensive and unusual roof. All loads were based upon the requirements of the New York Building Code. In addition to the dead-load itself, and any and all equipment



● *The heart of this beautiful Fog Fire Fighter built for the city of Coalinga, California by P. E. Van Pelt is a Hardie Imperial LCXA pump. The pump and 400 gallon tank are assembled on a White chassis.*



● *This Hardie Imperial LCXA Pump delivers 60 G. P. M. at 800 P. S. I. The smaller Hardie XCXX Pump delivers 30 G.P.M. at 800 P.S.I.*

A Hardie pump assures complete and lasting satisfaction in the ownership and use of a Fog Fire Fighter unit. Hardie gives sustained high pressure, ample volume and a long life of dependable trouble-free operation.

That is why leading builders of fire control equipment employ Hardie pumps and Hardie Fog Guns, in new or reconverted fog fire trucks.

Specify a Hardie pump when you buy a Fog Fire Fighter and get all the benefits of this amazing new fire control method.

THE HARDIE MFG. COMPANY

Los Angeles 11, Calif. • Hudson, Mich. • Portland 9, Oregon

Canadian Office—C. W. Lewis—Grimsby, Ont.

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HARDIE

High Pressure **PUMPS AND FOG GUNS**

for Fog Fire Fighters

Coupling #136C

Made Expressly for Fire Department Service

BAR-WAY
HOSE COUPLINGS

U. S. Patent 2367447

for HIGH PRESSURE FOG *lines*

USED BY LEADING APPARATUS BUILDERS

This is the ONLY high pressure coupling for fog lines approved by Underwriters Laboratories. It has been tried and proven over a period of years in various types of high pressure service with completely satisfactory results. Specify BAR-WAY high pressure hose couplings on all new fog lines—replace present fog lines-couplings with BAR-WAY, to insure against failure at crucial times. BAR-WAY couplings will take any ¾ inch hose with O.D. of 1¼" to 1 11/32". Just insert end of hose in coupling and screw on tight. Result—a fast firm connection that will not pull out. Hose will burst rather than pull out when subjected to extreme pressures. All couplings are bronze.

FULL FLOW
. . . no suppression of flow in coupling

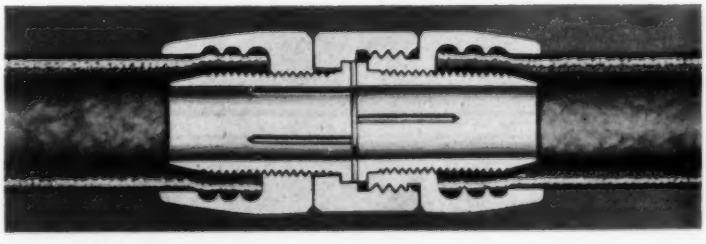
STREAMLINED
. . . free from objectionable projections—nothing to catch

INTERNAL EXPANSION
. . . no shrinkage of hose at coupling

HIGH PRESSURE
. . . tested to 2000 lb., 450 lb. pull

ACCURATELY MACHINED
. . . always the same—interchangeable

REMOUNTABLE
. . . use over and over again.



Available Thru Distributors

BAR-WAY MFG. CO.
STAMFORD, CONN.

which it must support, the roof will carry a snow load of 40 pounds per square foot.

The heat resistant qualities of the monolithic, or one-stone-system, have been evidenced in recent actual fires, one at the Modification Hangars at Dayton, Ohio; the other at the Naval Air Station at Norfolk, Va. In both of these cases, the subsequent damage to the structures involved were slight, and load tests, after inexpensive repairs had been made, attested to the complete restoration of the buildings.

Shops Will Have Newest Equipment

The new Shops will contain the latest improvements in equipment for testing and repairing fire department apparatus and appliances. Much of the old machinery and tools are obsolete and will be replaced. Some of the innovations designed by members of the Division of Apparatus and other City Bureaus will be located in the new set-up, together with specialized equipment under contemplation.

One or two of these Shop innovations are worth mentioning. Take the Presto Tire Dismounter, for example. This is the last word in rim removing. Invented by a member of the City's Department of Sanitation, the machine greatly facilitates the removal of large truck tires, sizes 6.00 x 20 to 12.00 x 20. Where heretofore the task of removing these tires occupied two men for most of a day, it is now with this new machine but a matter of minutes.

Then there is the new Automatic Tire Spreader, which operates by compressed air and hand-controlled valves and levers, to quickly spread the largest Fire Department tires as no ordinary spreader can.

Another feature of the Shops is the Otis Gasoline Motor Testing Panel—an ingenious testing board that checks a motor vehicle from the radiator to the rear wheels. Its mechanism is so complex, the wiring, relays and inner workings so complicated, that only the most skilled electrical and mechanical engineers may understand it. But it is a boon to the Shops, because the panel will point out in detail any defects in the compression, vacuum, fuel pressure, and consumption, driving power, brake force, acceleration and so on of a gasoline powered vehicle.

Deserving mention, too, is the gigantic Walter's Tractor Truck Wrecker, in use since 1945. This super-wrecker employs two cables, each capable of lifting 30,000 pounds, which receive their power from a take-off shaft directly connected to the motor winches. This Big Bertha of the Shops will snatch up and transport the largest, heaviest vehicle of the Department. There is a smaller unit, incidentally, for use in retrieving chiefs' cars, hose trucks and lesser vehicles.

In addition, there are countless power-driven machines and tools, speed-hacksaws, lathes, planers, shapers, woodworking and milling machines—in fact, the new Shops will have all the resources in materiel and manpower, to execute any and every type of repair and maintenance job that may eventuate, for the firefighting apparatus and tools of *"tomorrow"* as well as those of *yesteryear.*

Specify H.O.R.

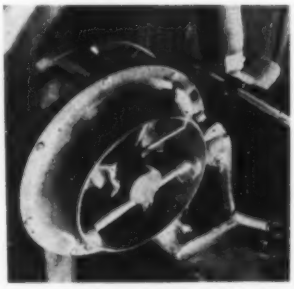
SIREN—Siren shall be of type A-2 H.O.R. or equal mechanical siren driven by separate pulley from fan shaft, or equal drive, and equipped with approved foot control.

New York and many other cities get the SIREN THEY WANT by SPECIFYING

H.O.R. MECHANICAL SIREN

Specify the H.O.R. mechanical siren and you get the results of our many years of research in the field, in order to obtain a siren, simple in construction, and safe at high speed with no danger of failure.

Mounted directly on motor block in a rigid position they instantly respond to full blast in a fraction of a second.



H.O.R. SIREN CO.
40 BROADWAY
NEW BRIGHTON
STATEN ISLAND, N. Y.

The Use of Wetting Agents in Forest Fire Suppression

(*Continued from page* 554)

and exposure. Ground photographs of Fires No. 1 and 2 were taken May 27th and were taken on panchromatic film with exception of I-E and I-G which were taken with infra-red film. Ground photographs of Fire No. 3 were taken May 28th with panchromatic film. Aerial photographs taken with panchromatic film were not acceptable because of a lack of contrast between dark green unburned areas and fire areas.

Type of Wetting Agent

The wetting agent used for extinguishment in the three fires reported herewith and in a majority of the fires in Rhode Island is *Drench*, which is manufactured by Arnold, Hoffman & Co., Inc., 55 Canal Street, Providence, Rhode Island.

The nozzle illustrated in Photograph III-H is a recent development of the Grinnell Corp., Providence, Rhode Island, for forest fire fighting.

Northwest Fire School Well Attended

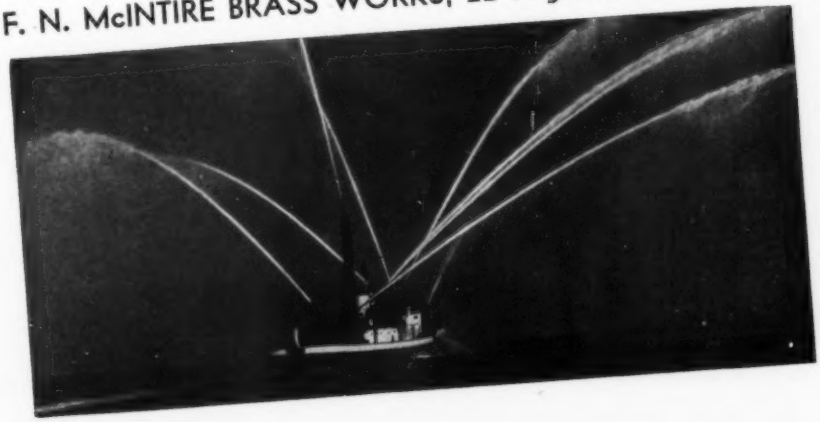
The Northwest Fire School, conducted in Minneapolis, May 12, 13 and 14 last, was attended by 481 firemen from 144 towns in Minnesota and elsewhere. The School is under the general direction of Leonard C. Lund, Deputy Commissioner, Fire Marshal Division, of the State of Minnesota.

.....champion of them all...bar none

INVINCIBLE NOZZLES

BETTER be *sure* when you order deck guns — they are a vital part of your equipment. You can make no mistake in ordering if you specify "Invincible Nozzles". We originated these guns in our plant and pioneered every major improvement in their development. We have the "know how". That's why fire departments from all over the world — and Uncle Sam's Navy as well — are using them in every corner of the world. Play safe — you will if you specify "Invincible" — the original and still the best.

F. N. McINTIRE BRASS WORKS, 22 High Street, Boston



ON NEW YORK'S FIRE FIGHTER

The million dollar N. Y. C. fire boat carries nine Invincible nozzles — (you'll see them in action at the IAFC Convention, Aug. 19-22). You'll meet chiefs from all over the world who use "Invincible" guns—they are

ON APPARATUS THE WORLD OVER

World Wide Fire News

By Roi B. Woolley

Flying Saucers—or Spots Before Our Eyes

Not since Orson Welles precipitated mass hysteria with his broadcast of the invasion from Mars in October, 1938, has the nation been so agog and atwitter as it has over the flying discs or saucers, reported seen from the Pacific Coast to Nova Scotia and from Canada to the Gulf.

Associated Press tabulations show the missiles reported from forty states, the District of Columbia and Canada. But, despite the $5,000 reward offered by a department store and the $1,000 by a Chicago manufacturer, nobody has come forward with the proof, although already the fire service has been called upon to investigate several of the "suspicious" objects.

The Fire Department at Van Nuys, Calif., in the Los Angeles area, is said to have in its possession a charred gadget about thirty inches in diameter and five inches thick, made of metal, with a radio tube in the center and a fin on one side, equipped with an "exhaust pipe."

Russell Long, North Hollywood construction engineer, said he was awakened the night of July 9 by a "pop," not so loud as an explosion, and ran out to find the finned disc had fallen into his flower bed. The press accounts of this event vary considerably in describing the "flying saucer," some saying that it fell flashing and smoking and that it had a blue light and emitted an acrid, chemical smell when Long examined it later.

Battalion Chief Wallace E. Newcombe, of the Los Angeles Fire Department, called to give an opinion of the gadget, said, "It doesn't look to me like it could fly."

Meanwhile astronomers, scientists, physicists, members of the army air forces and just plain newspaper readers and radio listeners continue to offer (gratis) their comments and opinions on the whys and wherefores of the whirling enigmas. Perhaps Dr. Ernest A. Hooten, Harvard University anthropologist, offers the best definition. Sezze, "The discs are spare or misplaced halos waiting for all the people who were killed over the Fourth of July weekend."

Meantime, our editors are eagerly awaiting the report of the first fire caused by, or attributed to, the "flying disc."

* * *

ICC Studies Atomic Transport

Another of tomorrow's traffic hazards crops up in the preliminary proposals to amend the Interstate Commerce Commission regulations so as to permit the handling and transportation of radioactive materials. The proposals indicate that much still is to be done before motor carriers can haul such materials with a fair degree of safety (and before firemen, who may have to fight fire in such carriers, may be properly safeguarded).

The eighteen-page proposals promulgated in May set forth elaborate labeling, packing and packaging and shielding requirements. However, important details affecting motor carriers and those who combat fires in carriers still remain to be worked out. Thus, nowhere in the proposals can there be found anything relating to driver protection, vehicle specifications, length of time vehicles may be used in regard to absorption of radioactivity, and the length of time a driver may safely operate a vehicle containing such materials.

* * *

Fears "A" Bomb War in Two Years

Fear of another world war in 1948 or 1949 was expressed by former Supreme Court Justice Owen J. Roberts testifying before the House Armed Services Committee. He disagreed with military heads that from ten to fifteen years would be required for other nations to perfect the atom bomb. He pointed out that we perfected the bomb in two years and asked, why can't others—emphasizing that a dictatorship has an advantage over a democracy in the bomb's manufacture.

"In other words," asked Representative Lyndon B. Johnson (D. Tex.) "you mean to say that our house is on fire and we've got to do sometihng about putting it out?"

"That's exactly it," replied Mr. Roberts.

* * *

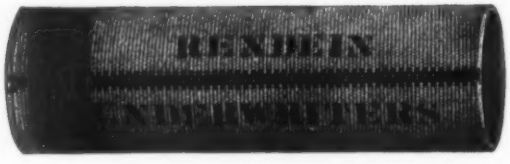
Hot Off the News Ticker

Fire damaged Service Club 1 in Camp Kilmer. All camp apparatus was called and a company summoned from

NIEDNER'S

UNLINED LINEN

FIRE HOSE



Hose bears the Underwriters' Laboratories "Yellow Label" and also meets the specifications of the Associated Factory Mutual Fire Insurance Companies.

NIEDNER'S

— RED CHAIN —

FORESTRY HOSE

Its flexibility makes it readily and easily rolled up while in a wet condition, so as to facilitate and expedite the removal of hose lines. Furnished plain or mildew proofed.

CHARLES NIEDNER'S SONS CO., Inc

.....MALDEN, MASS.

Punishment by the gallon!

When gallon upon gallon of water is forced through a fire hose under high pressure, you have to be sure the hose can take the punishment.

The way to be sure is to use *dependable* Hewitt Fire Hose!

Its smooth rubber tube assures fast flow and long life. Its jacket is woven under carefully controlled conditions of temperature and humidity. This helps to prevent stretch and minimize elongation and twist.

Remember, too, that Hewitt has been making high-quality fire hose since 1872!

Choose between the regulation white hose or wax-and-gum treated hose. Standard sizes for all fire-fighting applications are available. Write today for details.

Hewitt Fire Hose

HEWITT RUBBER
DIVISION
HEWITT-ROBINS INCORPORATED
240 KENSINGTON AVENUE, BUFFALO 5, NEW YORK

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New Brunswick to stand by. The two-story structure had been rebuilt following a fire less than a year ago. A soldier was arrested on suspicion of arson. . . . Reports from Lahore, capitol of Punjab Province, said that several hundred houses inside the walled city had been destroyed by arson fires. . . . A forest fire which devastated over 240,000 acres of Kenai Peninsula, Alaska, timberland ate into new areas, driven by high winds. Soldiers were said to have saved the town of Kenai. . . . In July, fire broke out aboard 20,000-ton White Star liner Franconia in Liverpool, England, but firemen using three pumps controlled it in thirty minutes. . . . Fire in 3,700-ton S. S. Eastern Guide, freighter, at Catherine Slip, East River, New York City threatened cargo of motor oil, tar pitch and asphalt, but was nipped by Manhattan fire fighters. Cause—welder's torch. . . . The Army's new flame thrower can fire a stream of flaming liquid 100 yards, is capable of (1) penetrating gun ports (2) burning, asphyxiating and blinding enemy personnel (3) igniting combustible parts of shelters and materiel (4) causing enemy to close emplacement parts (5) mopping up dug-in personnel and (6) eliminating enemy nests in street or jungle fighting. That's about all. . . . San Francisco had a temblor, shaking buildings, setting off some burglar alarms, firemen a brief moment of concern. . . . Ionia Island, N. Y., busy Navy ammunition depot forty-one miles north of 42nd Street, is to be deactivated. More than 2,300 Navy ships and 2,300 merchant ships received their ammunition from Ionia, during World War II. There have been but two fatal accidents at the 'hot spot'—one in 1903 when seven men were killed, and one man lost in the last war. . . . A $400,000 blaze menaced Mexicali, Mexico, destroyed eight buildings on Mexican side of International boundary. Fire Chief Jose Asuna Ruiz got aid from Calexico Fire Department across the border. . . . Fifteen persons, thirteen of them firemen, were treated for minor burns, smoke and chemical poisoning fighting a threatening fire in American President lines 10,780-ton cargo ship Marine Flyer at Pier 9, Jersey City, N. J. Sixteen Jersey City fire companies, fireboat John Harvey, N. Y. F. D., and two Coast Guard vessels and ten tugs fought blaze which was caused by spontaneous ignition of sacks of potassium nitrate. . . . Also in Jersey City a premature Independence Day celebration was staged—unofficially—when a quantity of magnesium burned in a junkyard. Fireworks-like display was visible for miles. Five fire companies stood by but Deputy Chief Thomas Malone said there was no immediate danger to surrounding areas.

* * *

Passengers Unaware Plane Is Struck By Lightning

Twenty-six passengers of a United Air Lines plane from Chicago and Cleveland landed safely at LaGuardia Field late in the afternoon, unaware that the right wing of the plane had been hit and slightly damaged by a bolt of lightning twenty-five minutes earlier when the plane was nearing New York.

After the lightning struck, injuring the right aileron, the plane's chief pilot radiophoned LaGuardia and officials directed him to a landing, while crash crews and fire equipment stood by in readiness for a possible crackup. The passengers heard the news after they alighted.

* * *

N. F. S. Does Considerable Pumping

Members of the National Fire Service volunteered to take a prominent part in operations for reclaiming agricultural land in Great Britain following the costly spring floods of 1947.

It is reported that, near Ely, fire pumps were returning 36,000,000 gallons of water daily back to the main stream.

The work was tiresome and risky and many of the men fell into the mud and silt through sheer exhaustion. This happened so frequently that patrols were established to cover the pumping area. One fireman was scalded by steam and another hospitalized as a result of injuries received when a lorry overturned.

The Watch Desk

(*continued from page* 568)

local police at Ravenswood, W. Va., are reported still trying to solve mysterious graveyard fire that destroyed unidentified body of man removed from the Ohio river. Body had been left in cemetery overnight for later burial and was discovered ablaze early in evening. . . . In Emeryville, Cal., a passerby called to Fireman William Webber,

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INSTALL THE NEW PEERLESS

On Apparatus in Service
No Repairs or Replacements
Under 25 Years

Beware of Substitutes and Imitations

Get the Genuine Peerless—Type E

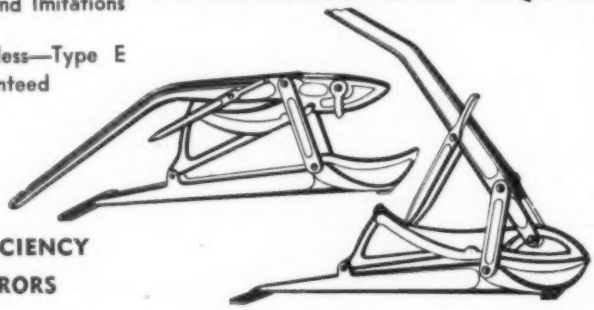
It's Guaranteed

THE NEW PEERLESS ON NEW MOTORS

All leading manufacturers equip apparatus with the Peerless when specified. The Peerless in three types on the market since 1910.

Hundreds of Fire Chiefs Can't Be Wrong.

CHANGES HAVE TO BE MADE—USE THE PEERLESS AND MAKE 'EM QUICK



SAVE TIME
PROMOTE EFFICIENCY
ELIMINATE ERRORS

PATENTED AND MANUFACTURED BY

KELLAM MANUFACTURING CO.

P. O. BOX 729 ATLANTA 1, GA.

152-162 mc. Communication Equipment

With the *Power Saver* circuit

That means longer life for . . .

quick-heat tubes

Separate switches for transmitter filament and plate voltages mean less battery drain and greater tube life. This "Power Saver" circuit is only one of the examples of advanced engineering that makes Harvey 152-162 mc equipment outstanding.

RECEIVER MODEL 541

Characteristics:

Frequency Range — 152-162 mc.

Type — Crystal controlled, single conversion superheterodyne FM Receiver.

RF Stages — Two, insuring excellent sensitivity.

Single IF Amplifier — Latest design practices achieve high gain from a single IF without requiring double conversion.

Crystal Diodes — In discriminator and squelch circuits, reduce tube complement, size and weight of the unit.

Oscillator Control — Provision is made for plug-in oven-type crystal when required by operations of the equipment in extreme temperature variations.

Automatic Frequency Control — May be used where necessary for Fixed Central Stations.

Standby Drain — 6 amperes.

Power Supply — AC or DC "Plug-in" Type. No further electrical or mechanical changes required in receiver.

TRANSMITTER MODEL 542

Characteristics:

Frequency Range — 152-162 mc.

Exciter Stages — Latest miniature tubes used.

Tubes — All "Quick-heat" tubes except for Oscillator A.F. Amplifier and the single Phase Modulator.

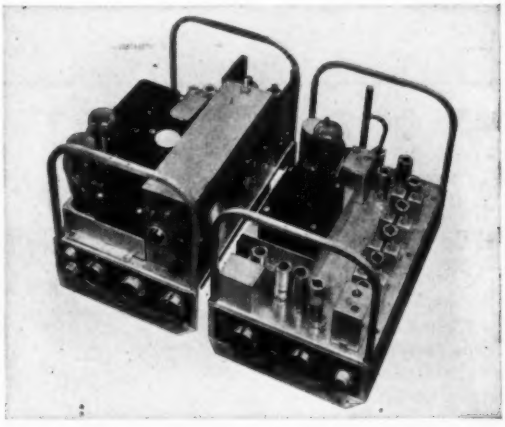
Final Amplifier — Push-pull, shielded parallel-line tank circuit, with a series-resonant link coupling circuit to antenna gives simple, effective and flexible antenna matching to mobile or fixed antennas.

Frequency Multiplication — 48 times, using "Quick-heat" tubes.

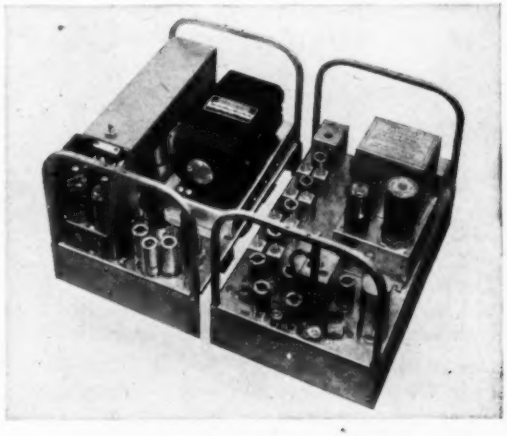
Power Output — 30 watts from AC or DC input. Standard deviation and pre-emphasis characteristics incorporated in the transmitter.

Standby Tube Drain — .45 amperes.

Power Supply — Change from AC to DC operation involves a simple tube change and "plug-in" of the DC power supply.



Transmitter (left) Receiver (right) shown with A.C. "plug-in" power supplies. (Front view.)



Transmitter (left) Receiver (right) shown with D.C. "plug-in" power supplies. (Rear view.)

HAR-CAM

HARVEY RADIO LABORATORIES, INC.

448 CONCORD AVENUE • CAMBRIDGE 38, MASSACHUSETTS

sunning himself in front of the fire station: "Hey, Bill, saw a car smoking out back,—looked like it was on fire—and, incidentally, I think it's your car." It was, and Brother Webber by dint of fast work saved it. . . . Says the sarcastic Danbury, Ia., "Review": "The National Board of Fire Underwriters claim fire-fighting equipment becomes obsolete after 20 years of service. The honorable board evidently has never seen the Danbury fire department's hose car which rolls right along with the time with the 20-year limit being left in the shade in the dreamy past." . . . In Brooklyn, Raymond MacQuill, 22, who was once arrested for impersonating a fireman, was again jailed on an arson charge as result of a small fire in Israel Zion Hospital. He admitted setting the blaze so that, by extinguishing it he could play "hero." He denied setting a fire in the hospital the previous Thursday.

Chicago's veteran fireboat, Joseph Medill, decommissioned in 1942 after many years of fire fighting, was sold for $3,100 to a used machinery dealer. Chief Fire Marshal Anthony Mullaney said crews that manned the Medill's pumps to keep it from sinking cost the city more than $1,700 monthly. . . . In Clinton, Mass., everyone was pretty much excited when fire broke out at the Clinton Hospital. But Sir Stork didn't bat an eye. He delivered a baby girl to Mrs. Charles Tomio (Thanks, Henry Hanson). . . . A cigarette-addicted sparrow which tried to build a lighted gasper into its attic nest in a Bloomfield, N. J., house is looking for new quarters. The coffin-nail set fire to the nest, which ignited the attic. Firemen prevented serious damage—and hastily cleared out what was left of the nest. (Thanks, Henry Gerke, Capt. No. White Plains F.D., and other anon. contribs.). . . . The LaSalle Hotel, Chicago, is still in difficulties. Following inspection of the rehabilitated hostelry, Fire Commissioner Corrigan refused to permit it to reopen until 48 violations were corrected.

BE SURE—SELECT THE BEST

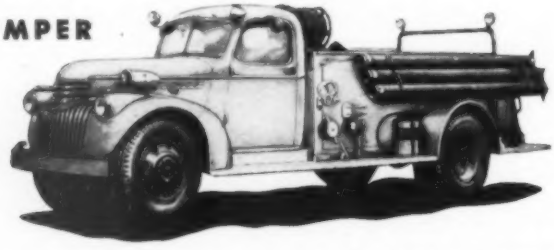
— IN PERFORMANCE AND SERVICE —

THE TANKER

● The Tanker, equipped with Barton-American Front Mounted Pumps, carries larger booster tanks than possible with midship pumps and receives full insurance credit rating.

Can be operated at high pressure with truck in motion—the most effective method of fighting running grass fires. Capacities to 500 gallons per minute.

THE PUMPER



● The Pumper features the Barton-American, Duplex-Multistage, Midship Pump in 500, 600, and 750 gallon sizes. It is designed for either metropolitan or rural duty, meeting all Underwriters' requirements.

One or more high pressure "fog" guns can be handled with pressures to 400 pounds. The Pumper has such exclusive features as remote discharge controls; single control drain valve and many others.

● The Tanker and The Pumper have such exclusive features as — wide streamlined bodies; frost-proof tank outlet valves; frost-proof vacuum primer; finger tip, pressure governor control and patented rear end, tank filler.

Both types are available on standard, commercial chassis.

AMERICAN
FIRE APPARATUS COMPANY
BATTLE CREEK, MICHIGAN

Questions and Answers

Choice of Suction Hose

To the Editor:

Our hydrants have only 2½-inch outlets. We have to use a 2½-inch fitting, attached to our 4-inch suction hose. Pumps do not get enough water at times, even though there is plenty in the mains.

Would we be better off if we used two 2½-inch hard suctions siamesed into the 4-inch suction inlet?

Supply pressure would be from a low of 5 P.S.I. to 60 P. S. I.

W. B. E.

Answer: The following figures will give pressure losses when 2½-inch suction is used between the hydrant and the pumper. The suction length is 10 feet.

At a flow of 500 gallons per minute, the friction loss in the 10 feet of suction hose will be in the neighborhood of 5½ pounds.

The discharge pressure within the hydrant to force 500 gallons per minute through 2½-inch outlet would be 9 pounds, and the friction loss from the main to the hydrant outlet will be 8¾ pounds, or a total pressure of 23¼ pounds. The hydrant must maintain this pressure in order to deliver to the pumper, through one section of 2½-inch hose, 500 gallons per minute.

If 4-inch suction were used, the friction loss in the suction would be cut down to approximately ½ pound. The discharge pressure at 500 gallons per minute through a 4-inch outlet would be approximately 1½ pounds and the friction loss in the hydrant will be the same, namely, 8¾ pounds.

Thus a pressure of 10¾ pounds will be required in the hydrant to deliver to the pumper through one section of 4-inch hose 500 gallons per minute.

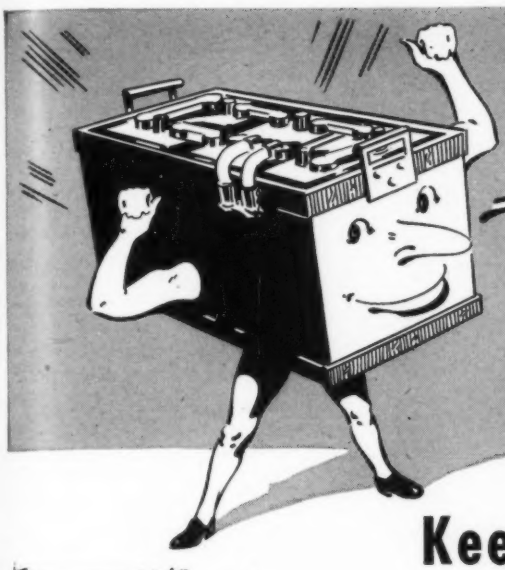
It would be far better to use two 2½-inch hard suctions if the pressure in the main were low. These would not be quite as satisfactory as a single 4-inch suction from the standpoint of friction loss, but would represent a material reduction in pressure losses over a single line.

The 5 pounds per square inch at a hydrant would not be sufficient to deliver enough water to a pumper to maintain satisfactory fire streams.

Gas Tubing

To the Editor:

1. Is metal flexible tubing recommended on gas appliances? Is it on the approved list of the Underwriters' Laboratories? If so, does it carry a

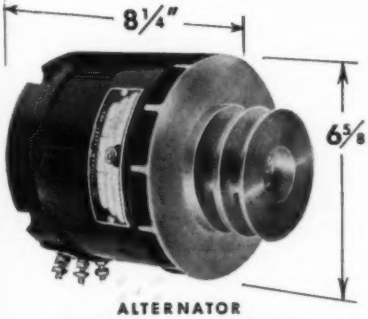


FULL OF PEP ALL THE TIME!

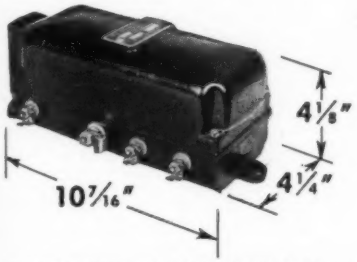
New Leece-Neville A-C Generating System

Keeps your batteries UP—

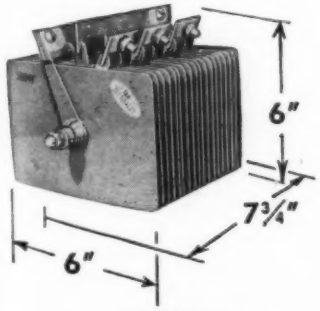
even with all accessories in use and your engine at idle speed!



ALTERNATOR
WEIGHT . . . . . 31 Pounds
RATING . . 14 Volts—100 Amperes



3-ELEMENT VOLTAGE REGULATOR
WEIGHT . . . . . 4½ Pounds
RATING . . 14 Volts—100 Amperes



RECTIFIER
WEIGHT . . . . . 7 Pounds
RATING . . 14 Volts—100 Amperes

Similar 3-unit system available for 6-volt service. SYSTEM WEIGHT: 41 Pounds. RATING 60 Amperes, 420 Watts

● Electrical accessories on fire equipment, often used for hours at a time while the equipment is standing still, place such a load on batteries that ordinary D-C generating systems cannot keep them properly charged. But this new 12-volt Leece-Neville system will never let you down! Delivering 50 amperes (potential 100) at idle engine speed (100 amperes at all driving speeds), it supports all or part of the load itself while keeping your battery fully charged. Add accessories as you choose, use your accessories without restraint even with engine idling —you can't overtax this high output power plant!

System weighs *60% less* than D-C equipment of comparable rating—can be installed with lighter brackets, less support. Alternator of simplified, trouble-free design occupies less space than conventional D-C generator. And with all these important advantages, this amazing A-C system costs less than comparable D-C equipment! For complete details of this new kind of power plant, visit your nearest Leece-Neville service station or write *The Leece-Neville Co., Cleveland 14, Ohio.*

LEECE-NEVILLE
Pioneer and STILL Quality Leader

CRANKING MOTORS • GENERATORS • VOLTAGE REGULATORS • SWITCHES

label and what is it like. In our city, we definitely discourage the use of any such tubing. I have recently been informed by an official of the gas company that their Association recommends copper tubing. If so, we have a conflict.

Answer: We have checked the Underwriters' Laboratories list of Approved Appliances and find that many brands of metal tubing have been approved, and labeled, for gas appliances.

The label varies with different equipment. On the tubing, it would probably be in the form of a tag attached to the tubing. On appliances, the label is usually stenciled right on the appliance.

No tubing containing rubber or fabric is listed in the bulletin on approved gas appliances of the Laboratories.

Relative Discharges

To the Editor:

With a hydrant pressure of 30 pounds, could you get more water from four 2½-inch lines in a 250-foot stretch with open butt than from a pumper with four lines of the same length with 1½-inch nozzle at 120 pounds engine pressure?

J. D.

Answer: In the problem you give, if the hydrant pressure of 30 pounds is maintained while the four 250-foot lines with open butts are in operation, you will get more water from the four open butts than you would from the single 1½-inch tip which you cite in the second part of your problem.

The method of calculating the problem is as follows:

For open butt, nozzle pressure = engine pressure ÷ (1.1 + KL).

$$K = 3.35 \text{ and } L = 5$$
$$N.P. = 30 \div (1.1 + 3.35 \times 5)$$
$$= 30 \div 17.85$$
$$= 1.68 \text{ pounds.}$$

Discharge from an open butt at 1.68 pounds per square inch pressure is

$$29.7 \times 2\tfrac{1}{2} \times 2\tfrac{1}{2} \times \sqrt{1.68} \times .90$$
$$= 216 \text{ gallons per minute.}$$

The discharge through four lines, each 250 feet long would be four times as much, or 864 gallons per minute.

Regarding the second part of the problem, we have four parallel lines of 2½-inch hose discharging through a single 1½-inch nozzle.

First combine each pair of parallel lines into a single line.

This is done by dividing by the conversion factor, and we get, as a result, an engine at 120 pounds pressure pumping through two 2½-inch lines each 69.4 feet in length, and connected to a 1½-inch nozzle.

$$N.P. = E.P. \div (1.1 + KL)$$
$$= 120 \div (1.1 + .135 \times 1.388)$$
$$= 120 \div 1.287$$
$$= 94 \text{ pounds.}$$

The discharge from a 1½-inch nozzle at 94 pounds is $29.7 \times 1\tfrac{1}{2} \times 1\tfrac{1}{2} \times \sqrt{94}$ = 648 gallons per minute.

Discharge from Bresnan Nozzle

To the Editor:

In FIRE ENGINEERING under date of August, 1940, a question appeared relative to the difference of output of water from a Bresnan nozzle and that from a 1½-inch straight nozzle tip.

If I remember correctly, it was stated that a 1½-inch tip straight nozzle would deliver more water at the same engine pressure than a Bresnan nozzle.

I would appreciate it if you would let me have the formula or method of working this example. R. L. W.

Answer: The total area of the orifices of a Bresnan distributor of typical make is 2.50347 square inches. The usual Bresnan distributor has six ½-inch orifices and three ¾-inch orifices.

The area of a 1⅝-inch nozzle is 2.0739 square inches and of the 1¾-inch nozzle, 2.4053 square inches.

Thus in actual discharge area, the Bresnan distributor is equivalent to a 1¾-inch nozzle.

When it comes to discharge, another factor enters into the problem. This is the interruption to free flow of water through the distributor by requiring it to abruptly change its course of direction. In the case of a plain nozzle, the flow is straight through and a minimum of turbulence is created. This keeps the loss in pressure to a minumum.

From actual figures on the discharge of a Bresnan distributor at different pressures, it has been calculated that the Bresnan distributor is equivalent to a nozzle of 1.2 inches in diameter.

DON'T FORGET

the 74th Annual Convention and Conference of the International Association of Fire Chiefs — August 19, 20, 21 and 22 at the Hotel Pennsylvania, New York City.

DON'T FORGET

to see the Wooster Brass Exhibit featuring many noteworthy and newsworthy items including the famous all-purpose Quadway Nozzle.

DON'T FORGET

to specify "Trumpet" quality whenever you need hose brass goods. Our complete catalog is available upon request. Our local representative is ready to help you with any of your requirements.

The WOOSTER BRASS COMPANY

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HOSE BRASS GOODS WB LINE THE WOOSTER BRASS CO. WOOSTER, OHIO

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MANUFACTURERS OF DISTINCTIVE FIRE FIGHTING EQUIPMENT

On this basis, calculations for friction loss, engine pressures, etc., have usually been made.

It must be remembered, however, that different designs of Bresnan distributors will change the flow characteristics and therefore the discharge at a given pressure. But we believe the above figures are conservative values.

Hose Layout for Turret Pipe

To the Editor:

How would you answer the following question?

You are in charge of an engine company and are directed to place your 750-gallon pumper carrying 100 feet of 2½-inch hose at a hydrant and deliver your full rated capacity to a turret pipe with a triple siamese intake. The distance is 300 feet. What hose layout would you use and what pump pressure will be required?

R. E. K.

Answer: You state that the 750-gallon pumper is carrying "100 feet of 2½-inch hose." We shall assume that it is carrying, instead, 1,000 feet. Furthermore, we'll have to assume a nozzle diameter, and this we'll take at 1½ inches.

We'll also have to assume an engine pressure, and this we will consider to be 120 pounds.

Three parallel lines of 2½-inch hose are stretched a distance of 300 feet to the turret pipe.

Nozzle pressure =
Engine pressure ÷ (1.1 + KL)

K for three parallel 2½-inch lines and 1½-inch tip on turret pipe is .061.

L is equal to 300 ÷ 50, or 6.
Engine pressure is 120.

Then N. P. = 120 ÷ (1.1 + .061 × 6)
= 81 pounds pressure.

Parallel Lines

To the Editor:

I know that on an average layout of ten lengths of 2½-inch rubber lined hose, using a 1-inch tip, to have a nozzle pressure of 50 pounds it is necessary to have an engine pressure of 107.5 pounds. I am told that if you add a second line to the above layout, as long as the engine pressure remains at 107.5, it is possible to still have 50 pounds pressure at both nozzles. Is this correct? J. P. B.

Answer: If two identical lines are stretched from a pumper, and the same size nozzles are used, the same pump pressure will be required to give identical nozzle pressures at the two nozzles.

This may be stated another way: If calculations are made for engine and nozzle pressures on a given layout supplied by a pump, and an additional identical layout is stretched from the same pumper, the nozzle pressure on the second line will be the same as that on the first, provided the engine pressure is maintained constant.

The same applies to three or four lines, where engine pressure remains unchanged and each hose layout and nozzle are identical.

Sure, it makes you mad!
A big fire . . . and you need lots of water and pressure. Tempers grow short when pumping equipment fails.
Why not replace your old pumper now, and be ready the next time you need water fast? Waterous Fire Pumps have earned an enviable reputation for dependability attained through outstanding design, backed by 61 years of manufacturing experience.
Compare the outstanding features and advantages of Waterous Fire Pumps . . . ask for copy of the illustrated Waterous Catalog. Colorful diagrams make it easy to see why Waterous pumps are standard equipment on so many leading makes of apparatus.
Also manufacturers of WATEROUS Fire Hydrants.
Waterous
Dependable
SINCE 1886
WATEROUS
FIRE PUMPS
WATEROUS COMPANY · ST. PAUL, MINNESOTA

Persons in the News

Harold Burke Named New York Fire Chief

Harold J. Burke, Deputy Chief of the New York Fire Department, who led the list in the recent civil service examination for head of that city's fire forces, was appointed Chief of Department on July 22, by Fire Commissioner Frank J. Quayle. He takes office August 1.

The appointment climaxes a series of events which created considerable mystery and has stilled a growing storm of protests in not only fire service circles, but among veterans and civil service organizations.

Commissioner Quayle, after the simple ceremony of inducting Chief Burke into office, said: "I have sworn in as Chief of the New York Fire Department, to become effective August 1, Deputy Chief Harold J. Burke. Chief Burke attained No. 1 position on the examination held for Chief of Department, regardless of his disabled veteran preference.

"Serving his country as captain in the United States Navy in World War II, Chief Burke established an enviable record in organizing firefighting forces. His record as Deputy Chief of the New York Fire Department has been most satisfactory, and in recent months he has served as Deputy Chief in Charge of the Borough of the Bronx. I am exceedingly pleased to recognize his many achievements, both as Deputy Chief, and as an officer of the United States Navy, by appointing him Chief of the New York Fire Department."

The controversy over Chief Burke began before the examinations for chief

Chief Harold J. Burke

of department. Prior to the tests, Commissioner Frank Quayle established a hitherto unknown position in the city's fire department, that of Chief of Staff and Operations and this was given to the then Acting Chief of Department, Frank Murphy, veteran, popular officer of the force, and a warm friend of Mayor O'Dwyer. The position of Chief of Department had not been occupied since it was abolished when former Fire Chief John J. McElligott became Fire Commissioner and combined the two positions of that office and fire chief.

In June, following the publication of the results of the test for head of the department, Chief Burke was relieved of his command as Deputy Chief in charge of the Bronx and relegated to the Limited Service Squad on the ground that his hearing was defective. This claim, however, failed to stand up. The Municipal Civil Service Commission held that Chief Burke was medically qualified for the post and this finding was supported by a well known ear specialist.

Chief Burke, who is 49, became a fireman on March 1, 1920, when he was assigned to Engine 58. On February 1, 1927, he was promoted to Lieutenant and became a Captain the following November. In June, 1934, he rose to Battalion Chief and his advancement to Deputy Chief followed in 1938. A veteran of World War I and II he entered the Navy in the latter conflict as chief of its combat fire-fighting service, in February, 1941. During his Naval service in which he rose from lieutenant to captain, he made an enviable record for developing advanced fire control and preventive methods and specialized fire fighting equipment and techniques, and for personal gallantry in the service. He has been decorated by the Navy for outstanding exploits and wears the Legion of Merit Medal for "exceptionally meritorious service." His name appears also four times on the Fire Department Roll of Merit and he holds departmental medals for outstanding performance of duty as a city employe.

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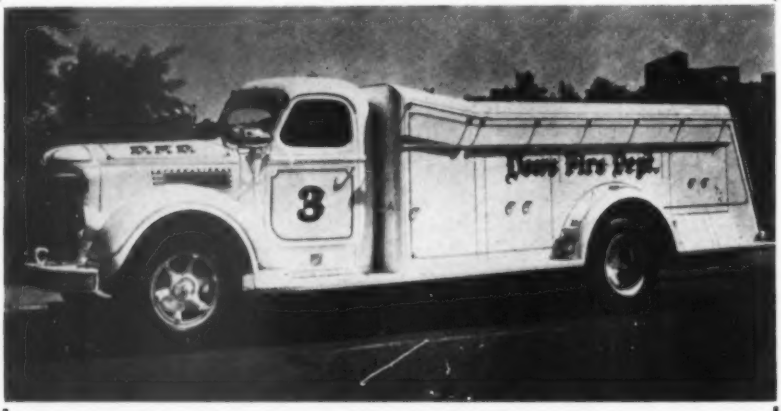

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Chief Burke has been active in national fire service developments. He is a member of the International Association of Fire Chiefs, the American Legion and numerous other organizations.

T. C. Hickson Chief at Dubuque

Captain Thomas C. Hickson, a member of the Dubuque, Ia., Fire Department since 1921, became the city's new fire chief, succeeding Perry H. Kirch who retired May 16 because of his health.

The new chief joined the fire department on May 1, 1921, was appointed to lieutenant on January 17, 1925; to captain on September 5, 1930; and to senior captain on July 1, 1941.

Chief Hickson, who holds a state certificate as fire instructor, has been attached to fire headquarters during all of his twenty-six years of service in the fire department.

The only applicant for appointment as fire chief after the resignation of Chief Kirch, he made a near-perfect grade of 96 on the civil service commission examination, June 25.

Chief Croom Completes 40 Years

J. Ludie Croom, who has recently completed forty years of service with the Wilmington, N. C., Fire Department, hopes to round out half a century before retirement. He is sixty-three years old and in point of service in his state is said to be outranked only by Chief W. H. Palmer of Charlotte.

He joined the Wilmington Fire Department in June, 1907, and was made lieutenant in 1912; in 1929 he was advanced to captain, and in 1932 he became second assistant chief. He was made first assistant in 1933 and promoted to Chief of Department on July 1, 1937.

Chief Croom was one of the three members of the fire service to start the North Carolina Fire College and Drill School, the others being William G. Hodges, now state insurance commissioner and F. J. Fitzgerald, Fire Chief of Asheville, N. C.

Chief Yeck—90-Year Old Vamp

Edwin Dufay Yeck, Chief of the Flora, Ill. Fire Department, is reported one of the oldest active fire chiefs in circulation. He organized the Flora volunteer department twenty-seven years ago.

Chief Paul Heinz Heads Connecticut Association

Fire Chief Paul P. Heinz, of the New Haven Fire Department, was elected president of the Connecticut State Fire Chiefs Association at the annual meeting held in Hamden.

Chief Heinz has been active in New England fire service organizations for some time. His Department's Training Ground continues to be a Mecca for members of the fire service who seek to keep abreast of the latest developments in fire control and prevention methods.

Elected with Chief Heinz were: Chief Henry G. Thomas, Hartford, first vice-

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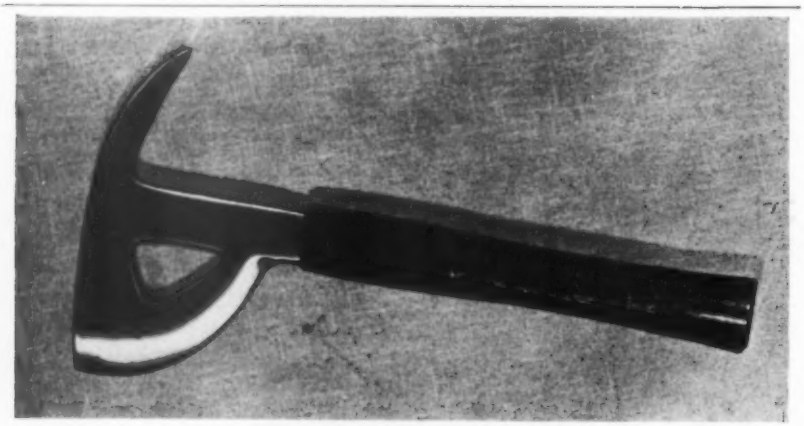

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president; Chief Thomas Shipman, New London, second vice-president; and David E. Mercer, Ex-Chief of Woodbridge, secretary-treasurer.

Sandhills' Officers Elected

Approximately 150 firemen from forty communities in Central and Southeastern North Carolina comprising the Sandhills Firemen's Association in convention in Sanford, N. C., elected the following officers for the coming year: Chief J. O. Bridges, Sanford, president; Assistant Chief A. F. Safrit of Hamlet, vice president; Assistant Chief E. P. Leatherbury of Hamlet, secretary and treasurer.

Fire Protection Expert Retires

Retirement of Simon H. Ingberg, Chief of the Fire Resistance Section of the National Bureau of Standards has been announced by Dr. E. U. Condon, Director of the Bureau.

Mr. Ingberg, nationally recognized authority on fire protection problems and methods, materially furthered the development of fire protection upon a scientific and mathematical basis. He contributed notably to improvements in fireproof construction through fire severity research. He instituted investigations to determine fire intensities, burning temperatures and to ascertain the behavior of steel and other materials during a fire. His researches into the flameproofing of textiles, of chimney and roof construction were widely acclaimed.

Mr. Ingberg was born in Ringsager, Norway, in 1877. He received his civil engineering degree from the University of Minnesota in 1909 and his master's degree in theoretical and applied mechanics from the University of Illinois in 1910. He joined the Bureau staff in 1914 and became chief of the fire resistance section in 1920. He is a member of the American Society for Testing Materials, the American Association for the Advancement of Science and the Philosophical Society of Washington and other organizations. For ten years he was secretary of the Federal Fire Council which is concerned with fire loss prevention for Government property.

Chief Geo. Sinclair Retires

Fire Chief George Sinclair, of Toronto, retired on June 30 after completing 52 years with Toronto Fire Department. When Chief Sinclair joined the Department in 1895, Toronto had a population of about 175,000 and used horse-drawn equipment for fire department vehicles. Chief Sinclair became a Lieutenant in 1906, Captain in 1910, District Chief in 1914 and Deputy Chief on May 1, 1919. He has been Chief of the Department since June 1, 1930. During his tenure of office as Chief, he organized the Fire Prevention Bureau and co-operated in the formation of the Toronto Arson Squad for fire investigation purposes.

Chief DeVleeschower Retires

Chief Charles J. DeVleeschower retired in July as head of the South Bend Fire Department. He began duty as a fireman in December 1921; became a

lieutenant in 1927; a captain in 1928 and was appointed Chief of the Department in January 1939.

The DeVleeschower family has played a prominent part in South Bend's fire service, the retiring Chief's father, Camiel J. DeVleeschower, having been a Captain of the force. He was killed by a falling wall at the Brandon-Durrell Department Store fire in 1926. A son of Chief DeVleeschower, Charles V., a veteran of World War II, was appointed to the department in 1945.

Chief DeVleeschower has for long been active in Indiana fire service circles, serving as an officer of the Indiana State Fire Chiefs' Association.

The new Chief of Department is Arthur J. Howard, who entered the force in 1924, became lieutenant in 1937 and captain in 1939. In leaving the service, Chief DeVleeschower was warmly commended for his service in the department by Mayor F. Kenneth Dempsey and other local officials.

Ex-Chief A. B. TenEyck Dead

A. B. TenEyck, former fire chief of Hamilton, Ont., died on May 24. Born on Jan. 2, 1855, in Windham Twp., County of Norfolk, he came to Hamilton 22 years later, in November of 1876. Four years after arriving in Hamilton he joined the fire department, which at that time numbered a chief, a foreman and sub-foreman, with six regular firemen.

Four years later he was made a captain in April, 1884. In the same year, 4 months later, he was made 2nd Assistant Chief. In May, 1897, he succeeded to the office of 1st Assistant Chief. Eight years later, following the tragic death of Chief Alex Aitchison on April 5, 1905, he was appointed to the position of Chief Engineer of the Hamilton Fire Dept., which he occupied until his retirement on January 1, 1923.

Members of the Hamilton Fire Dept. who received their training under Chief TenEyck and later became chiefs of large municipalities included Lawrence Clark, London, Ont.; William Gilbert, Saskatoon, Sask.; Joseph Pedler, North Bay, Ont.; John Smith, Guelph, Ont.; Henry Gillespie, Brockville, Ont.; Alfred Kappele, Stratford, Ont.; Jack Miterlla, St. Thomas, Ont.; Joseph Boisclair, Forest Hill, Ont.; Robert Aitchison, Kenneth Cassel and William Murdoch, Hamilton, Ont.; Archie Cameron, Ft. William, Ont.; Thomas Heath, Saskatoon, Sask.; George Gimblett, Peterborough, Ont.; Harry Guerin, Kitchener, Ont.

Joseph Finnegan Dies

Joseph Barnard Finnegan, 66, emeritus professor and head of the department of fire protection and safety engineering at Illinois Institute of Technology died suddenly July 4, 1947.

Mr. Finnegan was born in Stoneham, Mass. and educated at Massachusetts Institute of Technology. He joined the New York Fire Insurance Exchange at the age of twenty-three and later went to the Illinois Institute of Technology, where he spent forty-one years on the faculty, thirty as department head. Illinois Tech' is the only engineering college to offer a four-year course in fire protection engineering. Until his retirement, in 1946, every one of the school's more than 600 men who had

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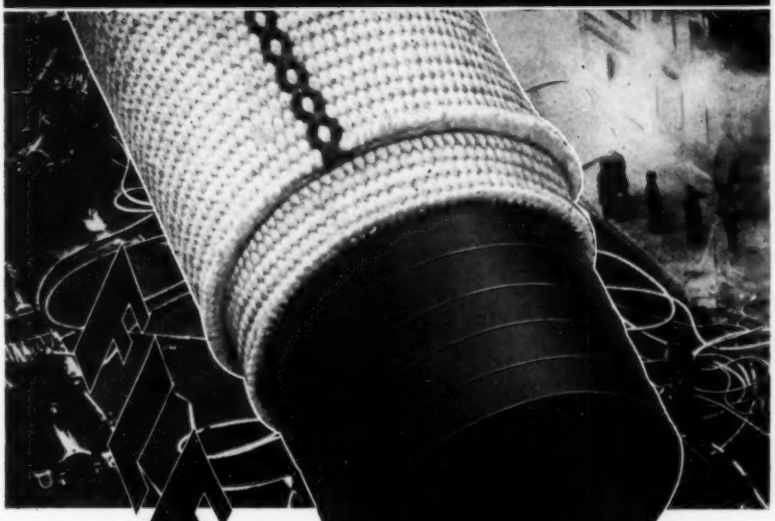

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received fire protection engineering were taught by Mr. Finnegan.

From 1906 to 1932, in addition to his teaching duties, he was assistant engineer of the protection department of the Underwriters' Laboratories in Chicago. From 1939 to 1944 he was editor of the College's Engineer and Alumnus magazine.

He brought a new concept to fire protection engineering, and his death is a distinct loss to those concerned with the reduction of fire waste, including the nation's municipal fire service.

P. Hildreth Parker Dead

P. Hildreth Parker, long active in the affairs at the New England Association of Fire Chiefs, died at his home in Belmont, Mass., on May 29.

Julius Stone Dead

Julius F. Stone, philanthropist, noted industrialist and civic leader, died on July 25, 1947, at his home in Santa Monica, Calif. He was 92 years old.

Mr. Stone was perhaps best known to members of the fire service for his connection with the Seagrave Corporation of Columbus, Ohio, in which city he spent most of his business life. He was chairman of the board of Seagrave Corporation, manufacturers of fire fighting equipment.

A tireless worker, Mr. Stone's career as industrialist, philanthropist, sportsman, banker, explorer and patron of education was based on only half a dozen years of formal education, but he gained his subsequent extensive education, culture and broad knowledge of life through omniverous reading and study.

He was born June 1, 1855, in Lenawee County, Michigan; worked as a railroad telegrapher at the age of twelve; his railroad career lasted until 1880. For the next twenty-three years he was interested in coal mining in Ohio and other states. Since 1903, Mr. Stone devoted most of his time to manufacturing and banking, as the head of numerous industrial and business organizations.

His scientific interest found outlet in numerous thrilling ways, such as leading the first major expedition by boat through the Grand Canyon. He was a Fellow in the American Geographical Society; Fellow in the Royal Astronomical Society of England, and member of the American Astronomical Society. He was one of the founders and president of the Industrial Research Foundation of Ohio State University and was later named Chairman Emeritus of its board.

In 1939 Mr. Stone was stricken with pneumonia, while in Arizona, and remained ill for some weeks, but he regained his health. Last November he suffered a fall in Columbus, from which he never fully recovered.

After retiring from active business in 1942, Mr. and Mrs. Stone moved to Santa Monica. He maintained to the end his keen interest in the fire service and in the Seagrave Corporation.

His son, George Stone, is prominent in Government circles in Washington, being the personal choice of Secretary Averill Harriman for the position of assistant secretary of commerce for air, which post he declined for business reasons.

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Appointments and Promotions

BURLINGTON, IA.—W. G. Middleman, former Assistant Chief, was appointed Fire Chief. He is a World War II veteran.

CENTRAL CITY, IA.—James Carpenter elected Fire Chief, succeeding M. H. Bishop who resigned because of ill health.

GRAETTINGER, IA. — John DeVries elected Fire Chief, succeeding George Frick, for twenty-five years a member of the Graettinger Fire Department.

MCGREGOR, IA.—William B. Walter, Chief of McGregor's volunteer fire Department for the past eighteen years, was named president of the Iowa Fire Chiefs Association. He was formerly vice-president.

BELLTOWN, CONN. — Joseph Mori, formerly Assistant Chief, was named Fire Chief of the Belltown Fire Department.

MASSAPEQUA, L. I. — Henry L. Baumann installed as new Fire Chief of Massapequa Fire Department at dinner-dance attended by 300 persons including numerous celebrities.

MOUNT CARMEL, PA.—Bernard Malkoski, member of the West End Fire Company is now Chief Fire Marshal of the Mount Carmel Fire Department.

MORRIS, PA. — Bert Briggs elected Chief, Morris Fire Department.

COLUMBIA, CONN. — Richard Davis elected Chief, Columbia Volunteer Fire Department.

OAK BLUFFS, MASS. — William R. Amaral appointed Fire Chief.

TOLEDO, IA.—Paul Yetter elected Fire Chief to succeed Milo Striley who resigned due to ill health.

RAMSEY, MICH.—John Hansiek named Chief, William Giackino, Assistant Chief, Bessemer Township Fire Department.

SEBRING, OHIO—John Watson formerly Assistant Chief is now Chief of the Sebring Volunteer Fire Department.

DUANESBURG, N. Y.—Charles Burtt elected Fire Chief, Duanesburg Volunteer Fire Department.

CLINTON, OKLA.—Ernest J. Stocks, twenty-year member of the Clinton Fire Department has been appointed Fire Chief to succeed W. N. "Pete" Gardner, Clinton Fire Chief for the past thirteen years, who recently retired.

OLNEY, ILL.—Roy Powers, Olney fire truck driver, was made Fire Chief succeeding Leo T. Arnold.

HANNAFORD, MINN.—Assistant Chief Gerald Anderson named Fire Chief following resignation of Oscar Ashland.

WEST FULTON, N. Y.—Millard Palmer named Fire Chief; Corwin Denny and D. A. Steward, First and Second Assistants.

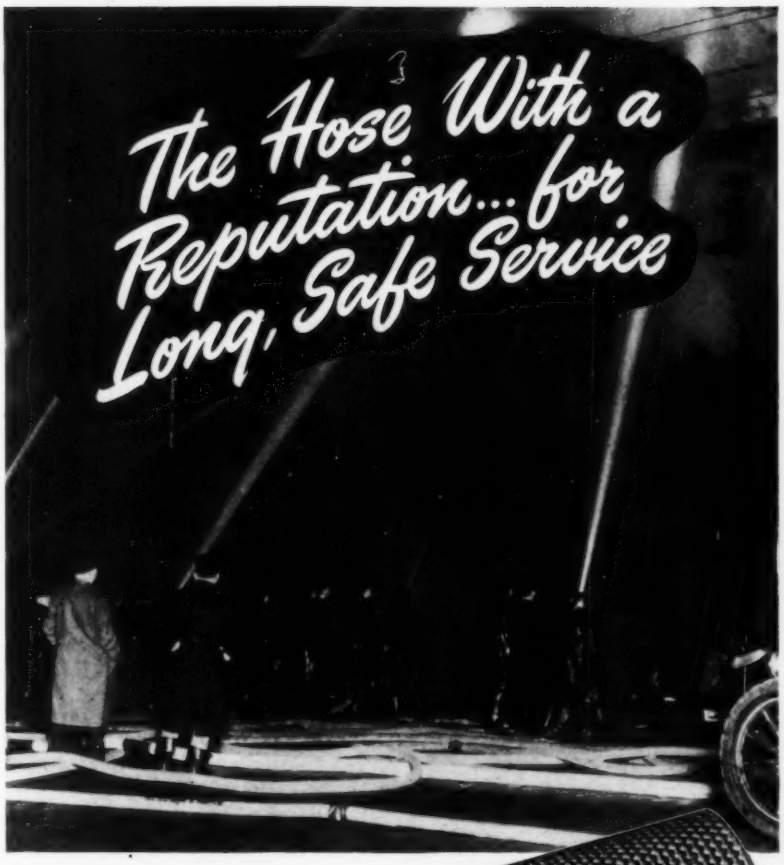
WHEATON, MINN. — Glenn Renner, elected Chief of the Fire Department.

ROLLA, N. D.—A. M. Julseth elected Chief of the Rolla Volunteer Fire Department.

ST. BONAVENTURE, N. Y.—Father Tom Plassmann, president of St. Bonaventure's College, is now Commissioner of the new St. Bonaventure Fire Department. Its single 500 G.P.M. pumper was purchased out of government surplus at Camp Shanks.

DAVENPORT, IA.—Captain Fred Swensen has been named Second Assistant Chief.

IOWA FALLS, IA.—Iowa Falls' Fire Chief Matt M. Kickels was honored by the local Rotary Club at an open house session, marking his fifty years' service



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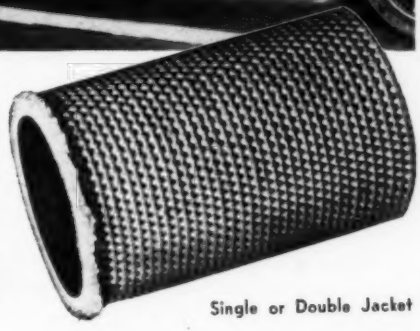
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in the department. John Strohm, Fire Marshal, was guest speaker.

SALISBURY, MD.—W. Austin Moore, a city councilman and thirty-year member of the Salisbury Fire Department, was elected chief of that organization.

WYCKOFF, N. J.—Samuel Braen has been elected Chief. He led a delegation of three companies in the June New Jersey-New York Volunteer Firemen's Convention at Bergenfield, N. J.

ST. JOSEPH, MICH.—Fire Chief Ray Hall was elected Director of the Michigan State Firemen's Association. More than 500 state firemen attended the convention, held in Benton Harbor, Mich., in June.

WEIRTON, W. VA.—Robert "Bob" Robinson was endorsed to head the Weirton Volunteer Fire Department.

SALEM, W. VA.—Winston Davis was chosen by Salem Volunteer Firemen as Chief of department. Holmes Woodward was elected president.

BRANFORD, CONN.—John Zvonkovic a member of the Branford Fire Department since 1928 was appointed Chief of the organization following the retirement of Chief Roy C. Enquist. The new chief is a Past Vice-President of the State Firemen's Association and a member of the New Haven County Fire Chiefs' Emergency Plan. Advanced to fill Zvonkovic's post is Alfred Skolonis who has served as Assistant Chief since 1946.

LUDLOW, MASS.—Rene H. Dubois, for twenty-four years a member of the Ludlow Fire Department, has been appointed Chief to succeed Edward V. Stone who retired recently after filling the post for forty years.

GLENDALE, CALIF.—Edward H. Aiman, who has been serving as Acting Chief of the Glendale Fire Department, has been appointed Chief. He joined the department as fireman in July, 1934 and rose through all grades, becoming Acting Chief upon the retirement of Chief A. H. Lankford in June.

WINSTEAD, CONN.—John J. Doherty was appointed Chief Engineer of the Winstead Fire Department. He served as fireman since 1912 and was formerly Assistant Engineer.

ELIZABETHTOWN, N. C.—Robert Cain, World War II veteran, was named Chief of the Elizabethtown Volunteer Fire Department.

WEST STAFFORD, CONN.—Charles Wilson elected Chief of the West Stafford Fire Department.

SHENANDOAH, PA.—Shenandoah's new Fire Chief, Milton (Bibs) Davidson, was honored at a special gathering in the Rescue H & L Co. quarters attended by local fire and civic officials, fire marshals and others.

COTTAGE GROVE, CALIF.—Orin D. McAbee was appointed full-time salaried Fire Chief of the local fire department, and Donald Sanfilipo and Julius Frugoli were named First and Second Assistant Chiefs, respectively.

RARITAN, N. J.—Joseph Liptak has assumed duties of Fire Chief, replacing Chief Arthur Emey. Patrick Esposito was named Assistant Chief.

MINERAL CITY, OHIO—Arlo Archinal was appointed Fire Chief to succeed Fred Barkheimer.

FLORA, ILL.—E. D. Yeck was reappointed head of the local fire department. He is 90 years old and has headed the Flora Fire Department for twenty-seven years.

PITTSFORD, N. Y.—Chief Grant L. Matthews, of the Pittsford Fire Depart-

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ment, was elected President of the Northern Central New York Volunteer Firemen's Association at the Association's recent convention.

BOWLING GREEN, VA.—Craig Woodward succeeds Paul Hudson as new Chief of the Bowling Green Volunteer Fire Department.

PALMYRA, N. Y.—Russel W. Dilks was elected Fire Chief, and Joseph Krager and Donald Powell were named First and Second Assistants, respectively, of the local fire force.

LAKE PLACID, N. Y.—George Winchell was elected to post of Chief of the local fire department to fill out unexpired term of the late Ray Bryant. Stanley Benham and Dominic Valenze were named First and Second Assistants.

KENOVA, W. VA.—George Babcock was appointed Fire Chief. He succeeds W. C. Moore.

MANSFIELD, MASS.—Roy S. Martin is the new Fire Chief, succeeding Arthur E. Sopher, who retired on pension. The new chief joined the department in 1899.

MECHANICVILLE, N. Y. — Dutchess County District Attorney W. Vincent Grady was chosen President of the Hudson Valley Volunteer Firemen's Association at the annual convention in June.

OSBORN, MAINE—Anton R. Jordan, Chief Warden of the Union River Forest District, has retired under the state retirement act, having reached the age limit of 70 years.

Ex-Chief Jordan served the state for 34 years, 10 as deputy and 24 as chief warden. His district comprised of 400 square miles of pulp wood and timber land stretched over 125 miles between the sea and the Penobscot River.

Before entering the fire service Ex-Chief Jordan had spent years in lumbering and log driving in this territory with his father, the late Nahum Jordan, one of the most famous of the old Union River log drive bosses.

It is doubtful if any man ever was as familiar with as much wild territory as Jordan. It was not unusual for him to have to lead a fire fighting party on foot for 30 or 40 miles over rough ground crossing streams and mountains, the crew carrying their equipment and supplies on their backs.

George Hooper of Franklin has been named chief to succeed Jordan. He is a veteran of World War I and has served five years as a tower watchman.

SURRY, MAINE—The village of Surry (700 Pop) has organized a fire department with Luther Carter, a retired Navy man, as chief. The entire force serves on a volunteer basis.

Equipment consists of a trailer loaded with one and one-half inch hose and a "Handy Billy" type portable pump. Most of the buildings in the village are close to the seaside so that the department will be able to put a small stream onto them.

Previously the village had depended entirely on the city of Ellsworth, seven miles away, to furnish a pumper with six men, for which they were charged at the rate of $25.00 per hour. This arrangement with the city of Ellsworth will be continued but it is felt that future fires may be knocked down or held in check while the Ellsworth company is making the long run in. Already several grass and brush fires have been controlled without calling in the heavy apparatus from Ellsworth.

ELLSWORTH, MAINE — Asst. Chief GeorgePartridge, a member of the de-

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partment for 17 years, has been appointed chief to fill the vacancy caused by the death of Royal Goodwin, who served as chief for 35 years and as a member of the department for a total of 40 years.

GRAFTON, MASS.—Horace Warren has been named chief of the Grafton, Mass. department; he held the office for 17 years previous to 1945.

DAVENPORT, IA.—James J. Quinn, First Assistant Chief, Davenport Fire Department, will become supervisor of fire prevention activity at the Alcoa plant, Bettendorf, Ia., July 15, 1947. He will have charge of all fire-fighting activities as soon as the $30,000,000 plant goes into operation. Chief Schick of the Davenport Fire Department said his leaving would be a distinct loss to the department.

Retirements

LUDLOW, MASS.—Edward V. Stone for forty years Chief of the Ludlow Fire Department, retired in July. He first entered the fire service with the Boston Fire Department and is credited with having brought the Ludlow Fire Department, which he joined in 1907, to its highest efficiency.

FAIRFIELD, ALA.—E. L. Allman, for eleven years Chief of Fairfield's Police and Fire Department, was dismissed from the post following charges brought in connection with his police activities.

MERIDEN, CONN.—Chief John Moroney has been retired on pension as head of the Meriden Fire Department. His successor is former Assistant Chief Leonard A. Petrucelli.

CENTERVILLE, PA.—Merton Bement has resigned as Fire Chief. He headed the local department since 1940.

NEW YORK, N. Y.—Seventy-five officers and men were retired from the New York Fire Department July 15, 1947 in line with Commissioner Frank J. Quayle's plan for recognition of the younger men in the ranks. Among those leaving the department are Battalion Chiefs Michael F. Ruddy, forty-eight years of service; Patrick Hickey; M. J. O'Donohue; R. J. Comiskey; Wm. J. Tierney, M.D., and J. B. A. O'Connor. Also Captains J. T. Lynch; P. J. Clark; J. P. Duffy; F. L. Petersen; W. F. Heslin; J. T. Lenahan; J. M. Roche; M. J. Stephens; Jos. Bona; R. R. Ellis and J. H. Banks.

Several of the men were retired on disability pensions. At the same time of the retirements Commissioner Quayle added 225 new men to the city's fire-fighting force as probationary firemen for a period of six months, at $2,900 salary.

Obituaries

SACRAMENTO, CALIF.—William Henry Lee, 67, North Sacramento's first fire chief, died. He was prominent in Masonic circles.

ARMONK, N. Y.—Frederick J. Cunningham, 40, Chief of the Independent Fire Company of Armonk, died suddenly a month after being elected chief.

SYRACUSE, N. Y.—Thomas Andrew Burke, 53, District Chief of the Syracuse Fire Department, died June 26, 1947. He was appointed a fireman in 1915; made lieutenant in 1927; captain in 1932 and District Chief in 1941.

BROOKVILLE, OHIO—Everett E. Brown, 60, Chief of the Brookville Fire Department, died in July.

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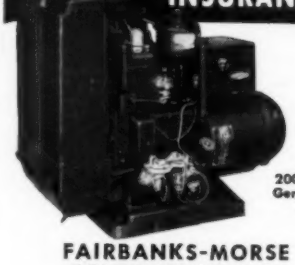

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Correspondence

Desert Drill Tower

To the Editor:

This comes from the Nevada Desert, better known as the Indian Springs Army Airfield. It is about a drill tower and drill area that we have constructed out of scrap material, gathered up around the base.

To begin with, we are starting on a new and extensive drill and training program, set up by the Fire Prevention Bureau, U. S. Army Air Force Flying Training Command. There are eighteen subjects to be covered and so we got together and decided we needed a drill tower for this work—and we did something about it.

Being isolated out here on the desert, we depend more or less upon our own resourcefulness to get things done, but we're lucky to have some G.I.'s that could build a good imitation of the Brooklyn Bridge if they had to.

The drill tower is built to represent the type of construction that we have here on this base. Although we do not have any two-story buildings on the base, we took into consideration the fact that at the main base in Las Vegas all of the barracks buildings are two-story and as any man here is subject to transfer to the main base we felt that a two-story tower would give us the required training along this line.

Constructional details are as follows: Frame construction, insulated inside with asbestos and sheet rock throughout. The tower consists of two buildings 10 x 12 and 7 ft. high with the tower located in the center. This is 28 ft. high and measures 10 x 12 feet. The second floor is 7 ft. high, with 2 x 2 ft. hatch in the roof, removable.

There is a 3 x 3 ft. opening in the floor with cover, making it possible to use a roof ladder inside from the ground floor to the second floor. The rooms on the ground floor are accessible by connecting doors into the tower. The tower is accessible from the outside by a door.

Building No. 1 has no door from the outside, but Building No. 2 has four doors opening to the outside. Adjoining the tower is a 6 x 6 ft. extension in the rear of the tower, which is accessible from the outside by a door. Twenty feet from the tower is a 14 x 18 ft. frame building which we can use for a smoke chamber and which also acts as an exposure to the main drill tower.

EDWARD J. WIRE,
Crew Chief, Fire Department,
Indian Springs Army Airfield.

Editor's Note: Crew Chief Wire is in charge of fire drills at the Base. He has had 26 years' experience in firemanship, five of them with the Army Air Forces as Chief of Crash and Structural Work. He is very enthusiastic about the work of his men, performed under weather conditions which are far from ideal. All firefighters do patrol duty in the area, which is famous for its high winds. The author and his men invite any suggestions and comments and will be glad to correspond with readers of FIRE ENGINEERING who are interested in building simple drill towers and in fire training. All firemen on the Base are members of the Nevada State Firemen's Association and maintain a keen interest in fire service activities.

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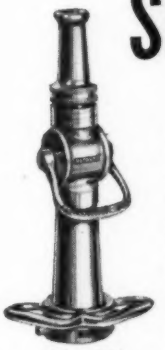

No. 900

No. 912

No. 900. A 2½" Shut-off Nozzle with play-pipe, complete with ladder hook and swivel leather handles. All brass body. Tip outlet can be furnished from ½" to 1¼" diameters. Shown equipped with No. 911 Plain Tip, but all nozzles are available with any Buckeye tip.

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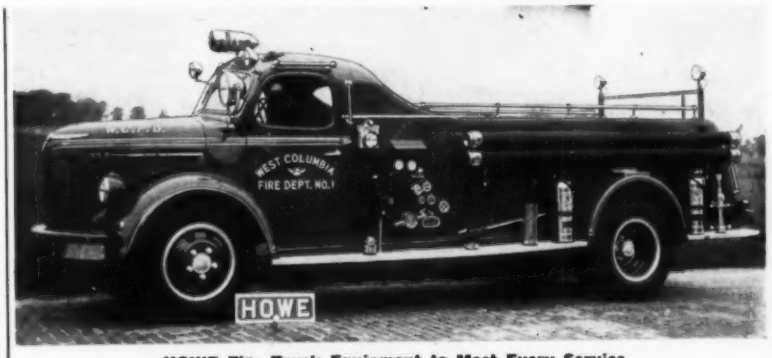

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Buffs Get Fire Badges

Like children anticipating a visit from Santa Claus, more than a score of Phoenix Society members gathered in San Francisco's Army-Navy Club for their monthly meeting on June 11 and to receive their new fire line pass badges.

Eyes sparkling and grinning from ear to ear, the membership broke out in an excited hub-bub as Joseph C. Connell, Ra of the Society, introduced James J. Sullivan, President of the San Francisco Board of Fire Commissioners, Fire Commissioner John F. Fixa and Chief Engineer Albert J. Sullivan.

New Fire Line Badges Presented to Members of Phoenix Society at San Francisco

Then, pounding the silver "joker" for attention, Ra Connell turned the meeting over to Commissioner Sullivan who, as Recorder Edward F. Patterson called the roll, presented each member with a badge. Turning to the group, Commissioner Sullivan said:

"I am proud and happy to participate tonight in what I consider a memorable step in the history of the Phoenix Society. The Board of Fire Commissioners discussed with Chief Sullivan at length the matter of approving issuance of these badges. It was upon his recommendation and from personal observances of the members of the board that the board decided to approve official recognition so that now you are the only group in San Francisco to have fire line passes.

"There are responsibilities and restrictions that go with acceptance of these badges. From your performance in the past, I know all of you will observe these restrictions and accept the responsibilities to the best of your ability. Believe me, it indeed has been an honor and a privilege to present these fire line passes."

Commissioner Fixa told the Phoenicians of his respect for the group and that he was glad to be a member of the Fire Commission that approved official recognition of the group.

Chief Sullivan then paid tribute to the members by remarking:

"I look forward to your help at fires, and now that you all have badges by which I can recognize you, I shall not hesitate in calling upon you when the occasion arises. In the past I have found you to be ready and willing to aid whenever you have been asked. It is especially true at multiple alarm fires that there is urgent need for immediate transmission of a message or an order.

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Oftentimes my aides are busy elsewhere. When seconds count, it is reassuring to know that members of the Phoenix Society are nearby to assist the Fire Department in its work."

The badges consist of a fire engine red maltese cross upon which is imposed a golden Phoenix, the mythical Egyptian bird which rose from the ashes and for which the society is named. The name "Phoenix" is spelled out in Greek under the Phoenix and below that is the motto, "Servabo Fidem." Above the cross in gold letters on a black background are the words "Fire Line Pass, Board of Fire Commissioners" and done similarly under the cross is a scroll inscribed "Phoenix Society, San Francisco." Phoenix members have been waiting for the badges since the Fire Commission approved issuance last January 2.

The Phoenix Society was founded May 13, 1932 and was incorporated in the State of California as a non-profit organization on April 19, 1940.

Through arrangement with a telephone service company, members who so desire are called at home or at work on all third alarms.

Most members are members of the Red Cross. During the war, the members acted as liaison between the Red Cross and the Fire Department. That work is being continued at present through a number of the more active members under direction of Bob Schaefer. BOB GREENOCK.

Rochester Cuts Firemen's Hours

Rochester, N. Y., firemen will work approximately 61 hours instead of the previous 70 hours after July 1, 1947, Public Safety Commissioner Tom C. Woods has announced. Forty-one additional firemen will be needed to make this change effective, it is said.

This change will bring the city's total Fire Bureau strength up to 532 officers and men. The present setup is 385 firemen, 42 lieutenants, 46 captains, 12 battalion chiefs and two training school instructors with the rating of battalion chiefs, three deputy chiefs and one chief.

The need for the additional 41 men was determined after study by a joint committee representing Fire Chief John A. Slattery and the Firemen's Aid Association, according to Commissioner Wood. The Municipal Service Commission will be asked shortly to certify names of men for appointment and Woods has suggested another examination as soon as possible to fill lists that will be reduced by these appointments.

After the new working conditions go into effect, four new officers will be selected from Civil Service lists made available after a June examination for battalion chiefs and captains, and an examination held June 20 for lieutenants. The new officers will include one battalion chief and three lieutenants, it is reported.

Boston Heights to Vote on Bond Issue

The village of Boston Heights, Ohio, will vote on a $27,500 bond issue at the November election for the purchase of fire apparatus and equipment and construction of a new fire station.

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The Round Table

(*Continued from page 575*)

number of parents leave their children to grow up on the streets instead of giving them the home life that every family owes to its children.

I believe the same laws should be applied to juveniles as apply to adults. I do not think that a person twenty-one years of age should be classed as a juvenile. Any person who has had sense enough to get an education into at least high school, knows right from wrong and should be punished accordingly. Of course, some children from seven to twelve years of age may not have had the opportunity of learning right from wrong, but above twelve, I think they do know the difference.

We have not had a case of juveniles setting any fires, but we have had a case of juvenile delinquency in an engine house that we had just completed. The children were about fifteen years of age and got into the engine house over the weekend playing tag and leaving dirty hand prints on all the walls, especially at corners where they would grab hold to make a turn, and also mud tracks on the floors. The paint was washed by the contractor and cleaned in a satisfactory manner. The children's parents, however, took them out of school for a day and with mop buckets and mops, the youngsters were made to scrub the floors throughout the entire engine house, going over them three times before the job was pronounced satisfactory by the superintendent of the construction.

Thomas H. Cotter, Chief, Providence, R. I.: In the period under discussion, eighty-three cases of juvenile fire setting occurred. Five cases were turned over to the Juvenile Division. The boys pleaded guilty and were sentenced to the Rhode Island Training School for Boys.

One of these fires turned into a two-alarm fire.

I believe that juvenile fire setting is caused by a desire for excitement and the lack of parental control. The juveniles have no fear of the consequences. I also believe parents should be held responsible for the acts of their children.

On the night of Oct. 6, 1945 there was fire in the cellar of a 3-story, 5-family dwelling located at 210-212 Sherburn St. Besides the parents there was a total of 17 children living here.

The alarm came in at 5:01 P.M. The fire was in the cellar in what appeared to be fresh paper and rubbish that had been brought in for the purpose.

When the Police questioned the children, Stanley Oshepsky, 10 yrs., admitted setting a fire in this cellar on Oct. 5th, the night before, but denied the fire of Oct. 6th.

While the investigation was going on, the Fire Department was again called to another fire in the same cellar at 6:39 P.M. This fire seemed to have been started in material that had been recently placed there. Several boys were brought to the Police station and the questioning continued. During the questioning the name of George Dwinnell, 15 yrs., of 210 Sherburne St. was mentioned. A police officer was sent out to bring

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him in and while the officer was in Dwinnell's house talking to Mrs. Dwinnell, the Fire Deparment again stopped in front of the house for another fire in the same cellar. This was at 8:08 P.M.

George Dwinnel was brought to the station and later admitted starting all three fires hoping that some of the other boys, whom he disliked, would be blamed and punished. He was turned over to the Juvenile Probation Officer and was committed to the R. I. Training School for Boys.

There was no damage caused by any of the fires.

C. L. Ligon, Chief, Fort Worth, Tex.: We have had five fires caused by juveniles from January, 1946, to date. The largest loss was $500.00.

The five cases listed do not include twenty-four cases where small children were playing with matches, torches, etc., even some of these might have been intentional.

The largest loss occurred in a junior high school where three teen age boys broke into the school and took a few articles. On leaving, they set the building on fire. The building was a large one and valuable, but the loss was only about $500.00.

I believe juvenile fire setting is caused by lack of supervision, principally by the parents.

Children should have more strict supervision and there should be extensive recreation privileges where possible.

Clement Murphy, Chief Engineer, Washington, D. C.: In the period under discussion we have had 191 fires caused by juveniles. Seventy-five per cent of this figure represents fires caused by children playing with fire or matches with no malicious intent. None of the fires has reached major proportions.

I believe the basic cause of juvenile fire setting is lack of parental guidance. Ninety per cent of the cases handled by this department were from broken homes and the children had no supervision from their parents.

I believe laws should be passed which would compel the parents of children to assume the responsibility of their offsprings until they reach an age of good judgment and sound reasoning.

F. J. Wells, Chief, Fargo, N. D.: We have had four fires caused by juveniles during the period under discussion, none of which reached major proportions.

The basic cause of juvenile fire setting is one which after you have studied it and given it some deep thought you end up with about the same knowledge you had when you started. However, I do think that there is a time in every boy's life when the thoughts of wanting to smoke play a part in fires started by juveniles.

We had very good luck last Summer with one group of boys. The Chief of the Fire Prevention Bureau and myself used what one would call fatherly questioning. We developed a very good friendship with the boys and then the desired results came out. Today we have at least three boys now working with other boys to explain what can happen when boys play with matches. Just whether this would work again remains to be seen. One thing I do know is that if you

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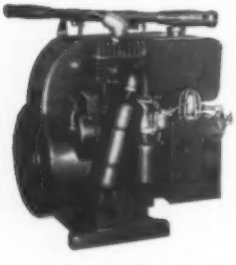

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DUNELLEN, NEW JERSEY

treat young boys, no matter where you meet them, as if they are your best friends they will be your friends when you want them to help.

C. E. Swanson, Chief, Sioux Falls, S. D.: We have had three fires caused by juveniles in the period from January, 1946 to date.

Most of our cases have been of ordinary set-ups of children playing with matches and of throwing fire crackers in buildings. The fire cracker instances were deliberate.

I believe that part of this unrest and fire setting activity is caused by lack of proper home environment and instruction. Too many mothers are engaged in full time employment or have too many outside activities which leave the children free to do as they see fit. Children are great imitators and the fact that people of this country are living a fast life and seeking thrills constantly, may have an effect on juvenile ideas.

I am of the opinion that there should be more fire prevention education and instruction in the public school and home.

Frank Pulaski, Chief, Boise, Ida.: We really have no juvenile "fire bug" problem here in Boise. For the whole year of 1946 we had not more than three small fires that kids had started in grass or trash in alleys. Even these could not be attributed to malicious incendiarism. Out here the youngsters have so much that is interesting and enjoyable to occupy their minds and time that serious juvenile problems are almost non-existent. We have perhaps three or four alarms turned in by the kids at Hallowe'en time. I know that youngsters in big cities are a problem and it's too bad. I believe radio programs, novels and movies with their crime suggestions are the greatest curse to children.

M. G. Bennett, Chief, Orlando, Fla.: We have not had any trouble with juveniles setting fires in the City of Orlando.

I believe the basic cause of juveniles setting fires is the lack of proper instructions in the homes and schools. I believe that if the Fire Prevention Committee and the various civic clubs would take more interest in Boys Clubs this would go a long way in eliminating this condition.

We have a high school student who was appointed by the president of the Student Council, serving on our Fire Prevention Committee. We are also offering cash prizes for the best Fire Prevention Posters drawn by the students in the Junior and Senior High Schools. We believe this will create more interest among the students and make them more fire conscious.

Frank Egenreither, Chief, St. Louis, Mo.: In the period under discussion we have had 146 fires caused by juveniles.

Although none of the fires set by juveniles developed into major fires, one loss in a six-family apartment building amounted to $4,210. This fire was confined to the basement. The total loss of all fires set by juveniles amounted to $9,400.

Many of the juveniles are left alone in the homes while the parents are at work.

There should be a daily instructive campaign by the teachers in the elementary, grade and high schools,

NOW IS THE TIME

To place your orders for winter equipment—Waterproof Turnout Coats and Trousers, Rubber Coats and Boots, Felt-lined Boots, Wool Mittens, Face Shields and, of course, for the ever dependable, up-to-the minute

CAIRNS HELMETS

In Leather, Aluminum or Flint-Flex, with removable ear laps and neck protectors and the famous CAIRNS CUSHION LINING. We can supply all your winter needs PROMPTLY, from America's oldest firm of firemen's outfitters. Write for Catalog.

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FIREMEN'S UNIFORMS

BADGES
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Manufacturers of uniforms for over 50 years

RUSSELL UNIFORM CO.
1600 Broadway, New York 19, N. Y.
Write for Fire Dept. catalog No. 55

HERE IS THE QUESTION FOR THE NEXT ISSUE

1. Are open garbage and rubbish dumps permitted in, or maintained by, your city?
2. Is your Fire Department called upon to extinguish fires occurring thereon?
3. If so, how are they handled?
4. Do you find them stubborn to extinguish?
5. Do rekindles frequently occur?
6. What method would you support for eliminating this nuisance?

pointing out the dangers of setting fires.

William J. Sudeith, Chief, Saint Paul, Minn.: From January, 1946 to date, we have had 145 fires caused by juveniles. We had fifteen fires with a loss of $1,000 or more and two of these were $5,000 or over.

Children are left alone much of the time due to both parents working, and they have access to combustible material more so now than when their mothers were home to watch them.

Parents should exercise more care and training. We feel that fire prevention should be added to the regular curriculum.

All cases have been solved. The majority of the children who have been brought in for questioning stated that they set the fires more for a pastime, for something to do and for the excitement of seeing the fire apparatus arrive.

Sidney L. Ulrich, Chief, Peoria, Ill.: In the period under discussion, we have had thirty-eight cases of juvenile fire setting. None of these, however, developed into very large fires.

We believe the basic cause of juvenile fire setting is parental delinquency. The parents of offenders should be publicly named and held liable for damages caused.

We have several interesting cases on file. One case involved two boys, ages nine and eleven, who broke into a large church and practiced acts of vandalism, destroying much property. In fact, the losses in this case exceeded $3,000 to the church and contents. It took place in the afternoon, and they intended to come back at night and set fire to the church. In the meantime, active action was taken and they were apprehended before they were able to fire the church. They confessed to the vandalism and also to their plan to set fire to the church.

We sometimes feel that there is too much leniency involved in these juvenile fire setting cases. Many times a plea is made to give them another chance, and they usually take advantage of it and you have another fire. We have a case on record where a boy of high school age set fires four different times and the "dear angel" is still walking the streets, due to the pleas of his parents, his school of-

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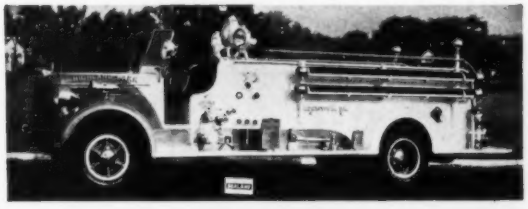
Special FOG and BOOSTER EQUIPMENT
. . . built to your specifications

Submit your requirements and let Sealand's staff of experts solve your problems.



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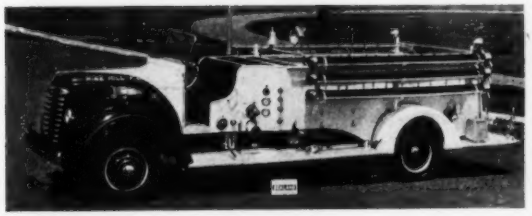
Built on standard commercial chassis for Highland Park Fire Department. Standard 500 gal. triple combination pumper.



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Built on standard commercial chassis. Standard 500 gal. triple combination pumper.

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Builders of RUGGED FIRE FIGHTING EQUIPMENT and DEPENDABLE FIRE ALARM SYSTEMS

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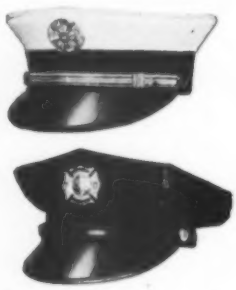

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FIREMEN'S BOOTS...

The Name of *Dependability*. Assuring the Firemen: *Safety, Comfort and Wear* in Boots *with 19 outstanding features.*

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RUBBER
FOOTWEAR
BEACON FALLS
CONN.

ficials and the church to which he belongs.

Henry C. Nelson, Chief, West Allis, Wis.: Since January, 1946, we have had 30 fires caused by children playing with matches. None of these fires developed into major proportions.

All of the fires caused by children that we have experienced have no doubt been due to the child's lack of knowledge of the dangers of fires, and have not been set with malicious intent.

I believe if the parents were held financially responsible for the damage caused by children to other people's property, by careless playing with matches, they would be more watchful over their children's activities. Either by education of the advertising public, or by providing penalty for the promiscuous distribution of book matches for advertising purposes, both for the distributor and the advertiser, it may be possible to eliminate many juvenile fires. Under this stipulation, the advertiser would take more interest in the manner in which his advertisements were handled, if he knew he would also be held responsible.

Frank M. Savage, Chief, Syracuse, N. Y.: We have had no fires during the past year that were started maliciously by juveniles.

Where these fires occur, I believe the problem can be traced to inadequate or improper parental supervision.

To eliminate it, I would recommend that parents or guardians keep a closer check on youngsters.

Classified Advertisements

Rates for "Proposals," "For Sale" and "Wanted" advertising, $5 per inch.

FOR SALE

FIRE HOSE—UNLINED LINEN, Yellow label. Surplus. Unused, clean, late date.

2½ Inch, 50 ft., with brass N.S. cplg. @ $10.00
1½ Inch, 75 ft., with brass I. P. cplg. @ $12.00
1½ Inch, 75 ft., with brass N.S. cplg. @ $12.00

Double Jacket, 1½", 50 ft., brass I.P. @ $12.50
Full Coverage Asbestos Fire Suits..... @ $5.00
Electric Alarm Bell, Heavy 8", 110 A.C. @ $6.00
2½ Inch Nozzles, N.S.T., 15" Brass.. @ $2.25

Siamese Wye Valves, For hose or hydrant connections. 2½" N.S.T. female to pair 1½" I.P.T. males. Solid brass with quick acting valve handles. $7.00. With 1½" N.S.T. @ $9.00.

HALPRIN SUPPLY COMPANY
140 E. 2nd St., Los Angeles 12, Calif.

WANTED
OLD FIRE BELLS

MENEELY BELL COMPANY
22 River St., Troy, New York

WANTED

Fire Equipment Dealers to sell Morning Pride protected rubber firecoats, fire pants, fire mitts and fire suspenders.

Write today Morning Pride Mfg. Co., 1986 Home Ave., Dayton 7, Ohio.

WANTED
FIRE HOSE
REPRESENTATIVE

Several good territories are available for an aggressive salesman or sales organization. Quaker's complete line is favorably accepted and may fit into your plans for distribution. If interested, write us in detail. We will treat your letter confidentially and if the territory you cover is open will arrange for a personal interview promptly. Quaker Rubber Corporation, Fire Hose Division, Philadelphia 24, Penna.

FOR SALE

Fire Hose delivery from stock any quantity. Can furnish any type brass fittings. 1½" single jacket 27¢ per ft., 1½" double jacket 49¢ per ft., 2½" single jacket 46¢ per ft., 2½" double jacket 89¢ per ft. Towson Hose & Rubber Co., 104 West Joppa Road, Baltimore 4, Maryland.

WANTED

3, 5 and 7½ H.P. Air Raid Sirens—used or surplus. Write Box 10, c/o FIRE ENGINEERING, 24 West 40th Street, New York 18, N. Y.

WANTED

Distributors wanted for fire apparatus sales by well known Mid-West Manufacturer—Sales help furnished. Address Box 20, c/o FIRE ENGINEERING, 24 West 40th Street, New York 18, New York.

DEALERS WANTED
AUTOMATIC FIRE EXTINGUISHERS

Wall—Ceiling—and amazing new Dwelling units. Best construction and operation available. Glass grenades in all sizes. 50% to 60% discounts. Freight free. Red Ball Co., Box 1552, Salt Lake City, Utah.

BARGAINS—LIMITED SUPPLY

15 lb. Kidde and Alfite C O extinguishers. New paint, recond., less charge $20, perfect. 2½ gal. foam, red, A1 condition $8 each. 3½ gal. CT wheeled type, perfect $25 foam generator. 2½" line, $25 FOB. Hopper Type. W. F. Brittle, Box 257, Warrenton, Virginia.

Interested in Fire Equipment Lines for Northern Virginia. Hose, trucks, miscellaneous items. Commission basis. Write what you have to offer, prices, etc., in detail. New setup. Fire Extinguisher Service, Warrenton, Va.

FOR SALE

Fire hose in 50 ft. lengths, 1⅛" double jacket cotton rubber lined with brass couplings, standard pipe thread only $12.50 per length; 400# tested; 1½" single jacket $11.50 per length; 2½" single jacket $21.00 per length. Navy surplus stock. Unused, in original factory cartons. Top quality brands. Goodwear Rubber Co., P. O. Box 6849, Baltimore, Maryland, Zone 4.

What's Burning

THE following list includes fires of $10,000 loss and over in the United States and Canada for the month of July, 1947.

Month Ending July 31, 1947

Marion, Ala.—Jewett Hall bldg. at Judson College damaged. Lightning.
Syracuse, Ind.—Plt. of Liberty Coach Co. destroyed.
Rockwell, Ia.—Public school bldg. destroyed.
North Adams, Mass.—Main bldg. of State Teachers College damaged. Lightning.
Wellesley, Mass.—Lumber and storage sheds of L. Grossman & Sons, Inc., Wellesley Hills, damaged.
Bend, Ore.—Bend Dairy Co. plt. destroyed Bend Produce Co. damaged. Faulty flue.
Austin, Tex.—Capital Prefabricators, Inc., destroyed.
Toledo, Wash.—River Shingle Co. destroyed.
Seattle, Wash.—Salmon Bay Foundry destroyed.
Los Angeles, Cal.—Aladdin Food Products Co. plt. destroyed.
Los Angeles, Cal.—Best Box Co. plt. and adj "Fix-It Shop," destroyed. Machine shop and four trucks damaged.
Cincinnati, Ohio—Plt. of United Paper Products Co. destroyed. Lightning.
Oakland, Cal.—Whses. of coastwide movers, machine storage whse. of Morris Lerman Co., and two homes damaged.
Montgomery, Ala.—Bldg., downtown section, damaged.
San Diego, Cal.—Eight dwellings and two garages, destroyed. Brush fire.
Toronto, Ont.—Textile bldg. damaged. Lightning.
Los Angeles, Cal.—Natl. Dyeing & Finishing Corp. destroyed. Faulty boiler room.
Glencoe, Ill.—Three bldgs. of Town & Country Frozen Foods Co., and North Shore Cube & Ice Co. damaged.
San Antonio, Tex.—Allen & Allen Bldg. Materials Co. plt. damaged.
Mission, B. C.—Sawmill destroyed.
Sherbrooke, Que.—Meat market of Julien Levesque destroyed.
Adel, Ga.—Adel Grammar school destroyed. Defective wiring.
Boise, Ida.—Fairview auction yard auto parts destroyed.
Detroit, Mich.—Dodge, main plt. of Chrysler Corp., damaged.
Fresno, Cal.—Blackstone Lumber Co.; five business bldgs. ocupied by Farmers Bag Exchange, Hobby shop of M. J. Madsen, carpenter shop owned by Jack Lockwood, Wymore Construction Co., Demmon Electrical Shop and house trailer of Pope Wells, destroyed.
Pasadena, Cal.—Market Basket Storage Bldg. damaged.
Princeton, Ind.—Rinehart Bldg., occupied by Pepsi-Cola Bottling Co. and apts. destroyed; also Swain Brothers' Garage, Commercial Printing Co., Jennings and Art Miller tavern, Wilhite Radio & Refrigerator Co. and Rinehart Insurance Agency, damaged.
San Jose, Cal.—Agnews State Hospital damaged. Spontaneous ignition from freshly stored hay.
Garden City, Kans.—60,000 bushel Gano elevator destroyed.
Breaux Bridge, La.—St. Martin Sugars, Inc., destroyed.
North Quincy, Mass.—Three bldgs. damaged. Crash of Navy airplane.
Trenton, N. J.—Park Theatre destroyed. Faulty wiring.
Columbus, Ohio—Gwinn Milling Co. destroyed.
Cambridge Springs, Pa.—Three thousand creosoted utility poles destroyed. Grass fire.
Mechanicsburg, Pa.—Potts Mfg. Co. plt. and Pennsylvania Railroad tracks, damaged. Explosion of small oil tank.
East Troy, Wis.—Main plt. of Trent Tube Co. destroyed.
Dishman, Wash.—Valley Furniture Co. destroyed.
Amarillo, Tex.—Four land sections growing wheat in Hansford County destroyed. Ignited by truck exhaust.
Camden, N. J.—Whse. occupied by Courtland Mfg. Co. and Morris Bloom Co. destroyed.
Madison, Wis.—Bldg. ocupied by sauerkraut factory and apt. damaged.
Russellville, Ark.—Arkmo Lumber Co. including mill planer, dry kilns, boiler room, storage sheds and retail office, destroyed.
Boise, Ida.—Fairview auction yard, grocery store, cafe and mattress shop, all owned by Ben Morgan, destroyed. Adj. Koppel Boys auto parts yard damaged.
Henderson, N. C.—Whse. of Henderson Bonded Whse. Co. destroyed.
Calgary, Alta.—Three story bldg. housing a furniture whse., electrical goods co., sporting

Who turned in the false alarm?
ULTRA-VIOLET PROD. INC. LOS ANGELES
find him with MINERALIGHT
• Progressive Fire Departments have identified false alarm offenders through the use of Ultra Violet light. Battery operated models of MINERALIGHT are ideal for on-the-scene detection. Other models for laboratory use...also combination models.
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485 *Pages Profusely Illustrated*

Be Prepared
to meet
Any Emergency
with
THE FIRE CHIEF'S HANDBOOK
The Greatest Book on Fire Fighting

Written by Fred Shepperd, in collaboration with the Educational Committee of the International Association of Fire Chiefs.

The most complete and authoritative source of practical, helpful data—gives reliable and dependable answers to almost every question that might come up in modern fire fighting methods.

Progressive fire chiefs, interested in keeping themselves abreast of current methods of meeting fire emergencies, need this book. It is the book every fire fighter should own and study.

$4 *Per Copy Postpaid*

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SAVE VALUABLE PLANTS AND MATERIALS

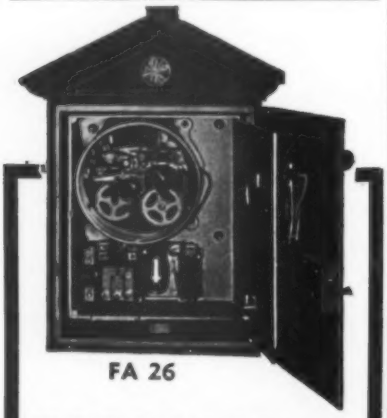
Fyr-Fyter equipment has proven its value in preventing small fires from becoming disastrous through the loss of life and property. Recent catastrophic fires with terrific loss of life emphasize the urgent need of fire protection. A complete line of UNDERWRITERS LABORATORIES Labeled FIRE EXTINGUISHERS.

HELP SAVE LIVES AND PROPERTY

Get Fyr-Fyters for safety's sake. We advise and serve manufacturing plants, public institutions, etc., immediately. Write us today regarding Fyr-Fyter equipment for your own protection.

THE FYR-FYTER CO.
Dept. 101-32, Dayton 1, Ohio

BUY BONDS **Fyr-Fyter**



FA 26

HARRINGTON FIRE ALARM BOX

Sixteen round succession non-interfering fire box with grounding device. Made of cast aluminum inside as well as out, which means fast, light, easy installation and a long, corrosion-free life.

They are equipped with quick action doors and are non-interfering, of the shunt and successive type circuit.

HARRINGTON SIGNAL COMPANY

MOLINE - - - - ILLINOIS

goods co., hardware store, music supply house and radio service damaged.

Joggins, Nova Scotia—Theatre, largest retail store and adj whse. destroyed.

Peterborough, Ont.—Wool whse. of G. Whitaker & Co. and adj. plt. of Dewart Milling Co. wool stocks, destroyed.

Decatur, Ill.—United States Mfg. Co. whse. destroyed.

Sawyer, Mich.—Theisen Clemens Oil Co. damaged.

Roseburg, Ore.—Live stock barns of Edward Kohlhagen, destroyed. Sparks in hay cutter.

Bellingham, Wash.—Shingle mill of Larson mills, Lake Whatcom, destroyed.

Canandaigua, N. Y.—Bldg. occupied by garage and paint shop, destroyed.

Sunderland, Ont.—Granary, mill and whse. owned by Sunderland branch of Peterborough District Farmers Cooperative, destroyed.

Ogdenburg, N. Y.—Ice storage house at St. Lawrence State Hospital destroyed.

Trenton, Tenn.—Birmingham Bldg., R. D. Malone Hardware Co. and Charlton & Kinsey Gin Co. damaged.

New Westminster, B. C.—Essondale Mental Hospital damaged. Two dairy barns and veterinary hospital destroyed.

Escanaba, Mich.—St. Ann's Catholic church destroyed. Defective wiring.

Flint, Mich.—A. Lee Brown jewelry store destroyed. R. & S. shoe store, adjacent, damaged. Short circuit.

Minot, N. D.—Fire gutted seven Minot business establishments in a three-block area in the northeastern section of business district. Six Texaco bulk storage tanks were in the fire zone. One was ablaze. The Westland oil bulk station, where the fire began, Mandan Creamery, Bridgeman Creamery, Farmers Union Oil Station, Lowes Grocery, Riverside Cafe and the Harmon Feed and Fuel Co. were the establishments gutted.

Pendleton, Ore.—The Big Western Milling Co. flour plant destroyed. Several nearby bldgs. including the Courthouse, damaged. Explosion.

St. Joseph, Mo.—Whse. and two DC-4 airplanes of Rosecrans Field, destroyed. Electric motor in an overhead door in the hangar.

I. A. F. C. to Form N. E. Division

Following action taken at the recent convention of the New England Association of Fire Chiefs to disassociate itself from the International Association of Fire Chiefs, plans are under way to form a New England Division of the International Association.

Former Chief Selden R. Allen, Director of the International from New England, has mailed to all I. A. F. C. members in the New England states the following notice, which is self-explanatory.

"Dear Chief:

"The recent conference of the New England Association of Fire Chiefs voted against affiliation with the International Association of Fire Chiefs and by such action deprived approximately six hundred Active and Associate members of the privileges and advantages of the educational and technical features, information and experience of the best minds in the Fire Service Field.

"The Constitution and By-laws of the International Association provide for reorganization in case of non-conforming Divisions.

"Arrangements are being made for all New England members attending the International Conference in New York, August 19-2 , 1947, to meet at some designated time and place in the Pennsylvania Hotel, Monday, August 18th, the day previous to the opening of the Conference to organize the New England Division of the International Association of Fire Chiefs and elect its officers: President, First and Second Vice-Presidents, Secretary, Treasurer, Director and such other officers as are deemed necessary.

"On the basis of the present count of those who are now members of the International, the New England Division

JANESVILLE QUALITY TURN OUT CLOTHING

Our turnout suits are giving excellent satisfaction in most of the large fire departments throughout the U. S. and

THERE MUST BE A REASON WHY SO MANY FIREMEN INSIST ON JANESVILLE QUALITY

NOW AVAILABLE

We can now supply old type ¾ Length and Knee Length Felt-lined Firemen's Boots.

JANESVILLE APPAREL CO.
JANESVILLE, WIS.

AT LOW PRICE!

NEW FOG NOZZLES
1½" $22.50 - 2½" $27.50

NEW FOAM NOZZLES
$37.50 each

NEW 500 Gallon PUMP
(Front End Type)
$175.00

RECONDITIONED PORTABLE PUMP
60 Gals. per Minute
$195.00

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Standard Makes - Sent on Approval
LIMITED SUPPLY

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GORHAM FIRE EQUIPMENT CO.
30 INDIA WHARF
BOSTON 10, MASS.

is third in size and can easily become the largest Division.

"We hope to meet and greet you at the New York Conference.

Fraternally yours,
"SELDEN R. ALLEN
"Director"

Navy Fire Fighters Organize

Edwin P. Cardinal, P. O. Box 658, Reno, Nev., secretary-treasurer of the Navy Fire Fighters Assn., recently toured the country organizing chapters for the new association. Fireman Reese O'Hanlon, E. 57, FDNY, is acting president. Fireman Allen Bridges, Ft. Worth, Tex., is vice-president. It is intended to have chapters wherever 10 or more former Navy fire fighters are located. The organization of former Navy fire fighters has the sanction of the Navy Dept. for its possible advantages for Naval Reserve fire fighting specialists. JERRY DALY.

Convention Dates

Aug. 18—EASTERN ASSOCIATION OF FIRE CHIEFS. Annual meeting. Hotel Pennsylvania, New York, N. Y. Secretary, Chief Charles E. Clark, Box 271, Wayne, Pa.

Aug. 19-22—INTERNATIONAL ASSOCIATION OF FIRE CHIEFS. Annual meeting, Hotel Pennsylvania, New York, N. Y. Secretary-Treasurer, Chief Daniel B. Tierney, 8 Robbins Road, Arlington 74, Mass.

Aug. 19-22—FIREMEN'S ASSOCIATION OF THE STATE OF NEW YORK. Diamond Jubilee Convention, Catskill, N. Y. Convention Secretary, Donald D. Haines, 153 Broad Street, Catskill, N. Y.

Aug. 28-30—WEST VIRGINIA FIREMEN'S ASSOCIATION. Annual meeting, Charles Town, W. Va. Secretary, J. D. Brehany, Ridgeley, W. Va.

Aug. 28-30—CONNECTICUT FIREMEN'S ASSOCIATION. Annual meeting, Naugatuck, Conn. Secretary, John Moehring, 56 Tom's Road, Stamford, Conn.

Sept.—JEFFERSON COUNTY VOLUNTEER FIREMEN'S ASSOCIATION. Annual convention and tournament, Chaumont, N. Y. Secretary, Jack Farrell, 513 Factory Street, Dexter, N. Y.

Sept. 1-5—WESTERN PENNSYLVANIA FIREMEN'S TRAINING INSTITUTE. Annual meeting, State Teachers College, California, Pa. Secretary, Henry Neill, Box 83, Vestaburg, Pa.

Sept. 2-4—KENTUCKY FIREMEN'S ASSOCIATION. Annual meeting, Hazard, Ky. Secretary, Captain V. A. Beam, 818 Sutcliffe Avenue, Louisville, Ky.

Sept. 2-5—MARYLAND FIRE SCHOOL. Annual meeting, University of Maryland, College Park. Director, Chief James W. Just, Fire Service Extension, College of Engineering, University of Maryland, College Park, Md.

Sept. 10-12—INDIANA FIRE CHIEFS ASSOCIATION. Annual meeting, McCurdy Hotel, Evansville, Ind. Secretary, Chief Archie McCabe, Muncie, Ind.

Sept. 14-17—PACIFIC COAST ASSOCIATION OF FIRE CHIEFS. Annual meeting, Hotel Davenport, Spokane, Wash. Secretary-Treasurer, Jay W. Stevens, Merchants Exchange Building, San Francisco 4, Cal.

Sept. 22-25—BUILDING OFFICIALS CONFERENCE OF AMERICA, INC. Annual meeting, Columbus, Ohio. Treasurer, Arthur N. Rutherford, Box 231, West Hartford, Conn.

Sept. 23-26—CALIFORNIA STATE FIREMEN'S ASSOCIATION. Annual meeting, Hoberg's, Cal. Secretary, James D. Young, 257 Robertson Boulevard, Beverly Hills, Cal.

Sept. 29-Oct. 2—INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION. Annual meeting, Grand Rapids, Mich. Secretary, Irvin Shulsinger, 8 East 41st Street, New York 17, N. Y.

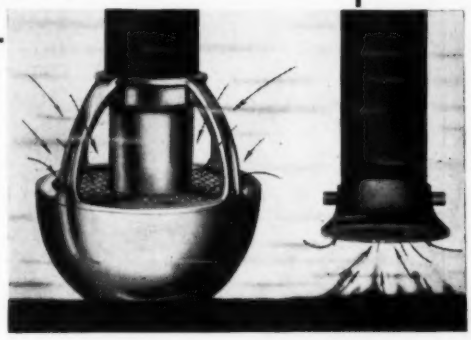
Oct. 7-9—FIREMEN'S ASSOCIATION OF THE STATE OF PENNSYLVANIA. Annual meeting, Lancaster, Pa. Secretary, Chief Charles E. Clark, Box 271, Wayne, Pa.

Oct. 21-23—NEBRASKA STATE VOLUNTEER FIREMEN'S ASSOCIATION. Annual meeting, Grand Island, Neb. Secretary-treasurer, R. D. Salak, P. O. Box 312, Schuyler, Neb.

Oct. 23-25—OHIO FIRE CHIEFS ASSOCIATION. Annual meeting, Lima, Ohio. Secretary, William H. Rosche, Asst. Chief, Fire Department, Canton 2, Ohio.

Don't Gamble With Your Fire Pump
If You Draft Water You Need

FILTER-FLO



It's new!

It's different!

the new FILTER-FLO *the old way*

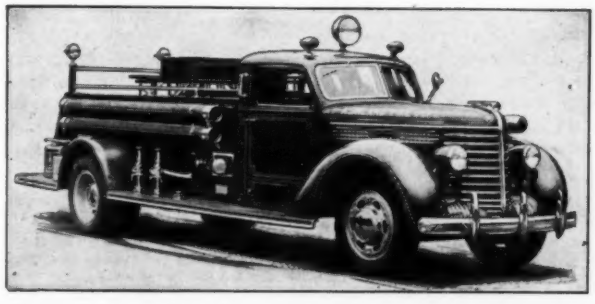
Adds years to fire pump life—Eliminates Clogged Hose Nozzles—Keeps Sand and Gravel out of your pump—Keeps Weeds and Marine Life out of hose lines—Sturdy—Dependable—Attractive—Made of Polished Aluminum. Filters the water twice before it can enter the hose—When in a vertical position it takes water only from the cleanest part of the stream.

SHEREN FIRE EQUIPMENT CO. **Mason, Mich.**

If your fire equipment dealer cannot supply you order direct. Specify size of suction hose and threads per inch.

FILTER-FLO is the new streamlined liteweight Suction Strainer Filter

Champion Fire Apparatus



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ADVERTISING INDEX
AUGUST, 1947

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Ahrens-Fox Fire Engine Corp. 577
Akron Brass Mfg. Co., Inc. 582
Aluminum Ladder Co. 520
American District Telegraph Co. 516
American Fire Apparatus Co. 598
American-LaFrance-Foamite Corp. 486; 492-493
American-Marsh Pumps, Inc. 506
American Mercantile Co., Inc. 604
American Rubber Mfg. Co. 605
Ansul Chemical Co., Fire Ext. Div. 584
Arnold, Hoffman & Co., Inc. 514
Atlas Safety Equipment Co., Inc. 488-489
Bar-Way Mfg. Co. 591
Beacon Falls Div., U. S. Rubber Co. 618
Bean Mfg. Co., John 512
Bishinger-Koehler Mfg. Co. 614
Body Guard Mfg. Co. 612
Boston Woven Hose & Rubber Co. 504
Braxmar Co., C. G. 613
Buckeye Iron & Brass Works 611
Buffalo Fire Appliance Corp. 511
Cairns & Brother 616
Carbine & Carbon Chemicals Corp. 583
Cardox Corp. 622
Carpenter Manufacturing Co. 503
Central Fire Truck Corp. 602
Circul-Air Corp. 608
Darley & Co., W. S. 621
Davy Automatic Fire Escape Co. 510
Dayton Fire Equipment Co. 612
Dictograph Products, Inc. 603
Duo Safety Ladder Corp. 507
E and J Manufacturing Co. 498
Elkhart Brass Mfg. Co., Inc. 518
Emerson Co., J. H. Inside Front Cover
Eureka Fire Hose Division 580
Excelsior Brass Mfg. Co. 610
Fairbanks, Morse & Co. 610
Federal Electric Co., Inc. 483
Firemen's Safti-Shield Co., Inc. 578
Ford Motor Co. 519
Fulton Bag & Cotton Mills 609
Fyr-Fyter Co. 620
Fyr-Fyter Products 616
Gamewell Co. 526
General Fire Truck Co. 490
Goodall Rubber Co. 607
Goodrich Co., B. F. 487
Gorham Fire Equipment Co. 620
Gorman-Rupp Co. 508
H.O.R. Company, Inc. 592
Hahn Motors, Inc. 615
Hale Fire Pump Co. 588
Hall-Scott Motor Car Co. 587
Hardie Mfg. Co. 590
Harrington Signal Co. 620
Harvey Radio Laboratories, Inc. 597
Hewitt-Robins, Inc. 595
Howe Fire Apparatus Co. 611
Janesville Apparel Co. 620
Kellam Mfg. Co. 596
Leece-Neville Co. 599
McDermott Corp. 614
McIntire Brass Works, F. N. 593
M & H Valve & Fittings Co. 606
Mack Mfg. Corp. 500-501
Manhattan Rubber Mfg. Division 513
Mars Signal Light Co. 522
Maxim Motor Co. 523
Mearl Corp. 615
Midwestern Mfg. Co. 579
Mine Safety Appliances Co. 495
Motorola, Inc. 505
National Foam System, Inc. 509
New Jersey Fire Equipment Co. 616
Niedner's Sons Co., Inc., Charles 594
Onan & Sons, D. W. 612
Oren Roanoke Corp. 581
Owens-Corning Fiberglas Corp. 499
Philadelphia Textile Finishers, Inc. 494
Pirsch & Sons Co., Peter Inside Back Cover
Porto Pump, Inc. 521
Powhatan Brass & Iron Works 515
Quaker Rubber Corp. 491
Randolph Laboratories, Inc. 606
Rensselaer Valve Co. 589
Republic Rubber Division 524
Riepling Corp. 613
Rockwood Sprinkler Co. 525
Russell Uniform Co. 616
Scott Aviation Corp. 586
Seagrave Corp. 496-497
Sealand Corp. 617
Security Fire Equipment Co. 614
Sheren Fire Equipment Co. 621
Smith & Co., D. B. 517
Stephenson Corp. Back Cover
Sterling Siren Fire Alarm Co., Inc. 604
Superior Fire Equipment Co. 610
Textileather Corp. 585
Ultra-Violet Products, Inc. 619
United States Motor Corp. 617
Victor Equipment Co. 502
Ward LaFrance Truck Division 485
Waterous Company 601
Wentworth-Forman Co., Inc. 618
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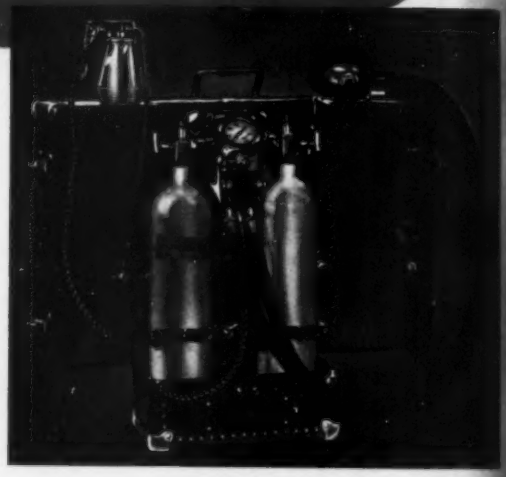

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